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If you have any suggestions for future research summaries, please send to: cmayer@edu.yorku.ca.

1. Cochlear Implants, Hearing, Speech and Language

Sharma, S., Cushing, S. Papsin, B. & Gordon, K. (2020). Hearing and Speech Benefits of Cochlear Implantation in Children: A Review of the Literature. International Journal of Pediatric Otorhinolaryngology 133, 109984. DOI: 10.1016/j.ijporl.2020.109984

The focus of this literature review was to establish the hearing and speech benefits of cochlear implantation, and to identify the factors that can contribute to an individual child's development after implantation. These factors include: age at implantation, the presence of medical comorbidities, bilateral versus unilateral implantation, and social determinants of health related to access to education, rehabilitaion and support after implantation.

Findings indicated that: (i) earlier age at implantation is crucial to reduce effects of deafness on the developing auditory system and capture the remarkable plasticity of early development, (ii) medical co-morbidities slow rates of progress after implantation, (iii) benefits of implantation increase in children who are provided with access to hearing from both ears, and (iv) access to the support needed in order to maximize hearing, speech and language development post-implantation declines with reductions in socioeconomic status and levels of parental education as well as geography. As the authors note, not only is there "a great disparity between developing nations and developed countries in terms of availabity of implant programs", there are are also significant concerns for access to accompanying resources for ongoing management and rehabilitation.

Key Insights: It has been well established that outcomes in hearing, speech and language are achieved by providing early access to sound in both ears. But it is also important to recognize that these benefits can be limited by known social determinants of health which may restrict access to needed support and that access may vary depending on geography. To gain maximum benefit from cochlear implantation it is critical that attention is paid to providing the necessary resources and support.

The abstract of the article and contact information for the authors is available here.

https://www.researchgate.net/publication/339790509_Hearing_and_Speech_Benefits_of_Cochlear_Implantation_in_Children_A_Review_of_the_Literature

2. Cochlear Implants and Literacy Development

Mayer, C. & Trezek, B. (2018). Literacy Outcomes in Deaf Students with Cochlear Implants: Current State of the Knowledge. Journal of Deaf Studies and Deaf Education 23(1): 1-16. doi: 10.1093/deafed/enx043.

Historically deaf learners have lagged significantly behind their hearing age peers in reading and writing achievement. Yet, compared to other areas such as hearing, speech and language, less research attention has been paid to the impact of cochlear implantation on literacy development. To identify how cochlear implantation is impacting literacy outcomes, Mayer and Trezek did a systematic review of the available research and identified a total of 21 studies published over a 20-year time period (1997-2016), collectively reporting on data from 1000 cochlear implant users. They found that the majority of participants had reading comprehension scores in the average range, although they noted that there was a wide range of variability in these outcomes. There were only 3 studies reporting outcomes in writing. They also discuss how factors such as age at implantation, presence of additional disabilities, consistency of device use, and communication modality impact outcomes.

In summarizing their findings, the authors note that although not every child with a cochlear implant is successful in achieving age-appropriate literacy outcomes and/or maintaining these outcomes over time, deaf students with cochlear implants are demonstrating reading and writing outcomes that far surpass those historically reported for the deaf population. This represents a noteworthy shift, arguably unprecedented in the history of the field. However, it is also the case that the evidence base is not as robust as it needs to be, both in terms of how students are doing and in identifying those areas of weakness requiring additional pedagogical attention and support.

Key Insights: It would be important to raise awareness of the positive impact that cochlear implantation has, not only on hearing, speech and language, but also on reading and writing outcomes for deaf children. Achieving age-appropriate performance is now possible for many deaf students – a significant change from what was expected in the past. However, more research is needed to understand the factors that influence these outcomes and how to best maximize achievement for all deaf students with cochlear implants.

The complete article can be accessed at:

https://academic.oup.com/jdsde/article/23/1/1/4344843

3. Cochlear Implants and Social-Emotional Development

Boerrigter, M., Vermeulen, A., Marres, H., Mylanus, E. & Langereis, M. (2021). Self-concept of Children and Adolescents with Cochlear Implants. International Journal of Pediatric Otorhinolaryngology 141:110506. Doi: 10.1016/j.ijporl.2020.110506.

Any children with special needs are at higher risk of being socially excluded and having a poorer self-concept. This "at-risk" group includes those with cochlear implants, although relatively little is known about the impact of implantation on self-concept. To address this gap, the researchers in this study assessed the self-concept of children and adolescents with CIs and comparisons were made to hearing age peers.

A retrospective patient file study of 53 CI participants with a mean age of 14.2 was conducted. Self-concept was measured with the Dutch language version of the Self-Perception Profile for Children and Adolescents and proportions of low, normal and high competence scores were compared to a normative sample. Outcomes were analyzed for the total CI group and for two sub-groups – those educated in the mainstream and those educated in specialized classes for the deaf.

The researchers found that in the areas of Scholastic Competence, Athletic Competence, Physical Appearance and Behavioral Conduct, larger proportions of highly perceived competence levels were found in the CI Total group in comparison to the hearing normative sample. Interestingly students with CIs in both the mainstream and specialized classes reported self-concept scores comparable to their hearing peers. Speech perception and language comprehension were positively correlated to Scholastic Competence.

Key Insights: This study has shown that self-concept levels of children and adolescents with CIs in both the mainstream and specialized settings are comparable to those of their hearing peers, and they are generally satisfied with their functioning across a range of domains. This is important information for thinking about the social-emotional well being of students with CIs and making decisions about educational placement.

The complete article can be accessed at:

https://www.sciencedirect.com/science/article/pii/S0165587620306492?via%3Dihub