

08.03.2021

**The Effect of Music Integrated Phonological Awareness
Program on Phonological Awareness Skills of Preschool (5-6
Years) Cochlear Implant Users**

Study Protocol and Statistical Analysis

A. Official Title of the Study:

The Effect of Music Integrated Phonological Awareness Program on Phonological Awareness Skills of Preschool (5-6 Years) Cochlear Implant Users

B. Rationale and Purpose of the Study:

Reason for this study: There is a study in the literature that provides music-integrated phonological awareness training with normal-hearing children and investigates the effect of phonological awareness, but there is no study that observed the effect of phonological awareness after musicintegrated phonological awareness training in preschool children using cochlear implants.

The aim of this study; The aim of this study is to apply a music-integrated phonological awareness education program to 5-6 year old children using cochlear implants and to examine the effect of education on phonological awareness skills.

C. Main Study Form:

C.1.1. General Information:

Phonological awareness is a comprehensive skill in recognizing and using the units of oral language (Soleymani, Mahmoodabadi, & Nouri, 2016). Phonological awareness skill requires the analysis of speech sounds, either alone or in words, expressions, sentences, as independent phonemes (Saad, 2013).

Phonological awareness skills begin in the preschool period and continue to develop during the school period (Carroll, Snowling, Stevenson, & Hulme, 2003). Therefore, it is an important component of education that should be addressed in order to prevent reading difficulties that may occur in children during academic education (Phelps, 2003).

To perceive both music and language, it is necessary to be able to distinguish sounds. Sounds can be characterized by certain spectral feature. These spectral features are found in both musical and linguistic sounds (Pesnot Lerousseau, Hidalgo, & Schön, 2020).

Being aware of the fact that the units in the music can be broken down into smaller parts is an important skill to be acquired before manipulating the verbal units (Davis, 2019).

It is known that music education improves language skills without focusing on existing deficiencies (Patscheke, Degé, & Schwarzer, 2016). There are extensive studies in the literature showing that teaching music facilitates the development of language skills in general and reading skills in particular (Herrera, Quiles, Defior, Fernández Smith, & Costa-Giomi, 2011).

Studies have suggested that some auditory analysis skills used in language processing, such as combining and separating phonemes, are similar to the skills required for music perception, such as rhythmic, melodic and harmonic discrimination (Anvari, Trainor, Woodside, & Levy, 2002).

Children with congenital hearing loss rely on auditory input delivered through a hearing aid or cochlear implant to hear speech structures. A hearing aid (HA) amplifies sounds to an audible level. This increases a child's access to time-varying spectral information of speech recognition structures and phoneme changes to support the acquisition of phonological skills. As hearing loss increases, the ability to receive information from an audible signal decreases (Ching, Dillon, Katsch, & Byrne, 2001).

Recent studies in children with severe or profound hearing loss have focused on evaluating the effectiveness of cochlear implantation. There is general agreement that children using cochlear implants perform within the normal range for tasks involving syllable counting or tracking, but exhibit deficits for tasks that require phoneme-level perception and manipulation (Ching, Cupples, 2015).

Individuals with hearing loss have limitations in understanding the phonological knowledge of speech. For this reason, the reading and writing development of hearing impaired individuals is not at the desired level (Chelsea, 2014).

Many studies have been done; shows the relationship between musical skills, phonological awareness and literacy abilities. (Bhide et al., 2013; Christiner & Reiterer, 2018; Herrera et al., 2011; Krau et al., 2014; Moritz et al., 2013).

C.1.2. Materials and Methods C.1.2.1.

facts

23 children with cochlear implants and 23 with normal hearing will be included in the study.

Inclusion Criteria:

☐ Bilateral severe sensorineural hearing loss and those who use unilateral or bilateral cochlear implants

☐ To be between 5-6 years old

☐ To have receptive and expressive language at the level of their peers from the language test to be made

☐ Regular users of cochlear implants

Exclusion Criteria:

☐ Not meeting any of the inclusion criteria for the working group,

☐ Having an additional disability

☐ Those who use drugs that may affect the auditory system

C.1.2.2. Methods to be Used in the Study

a. Laboratory and clinical evaluation methods to be used in the study

All participants will be given language assessment, spectral-temporary modulated ripple test (SMRT) and phonological awareness and auditory evoked late potential tests.

Participants' phonological awareness skills will be evaluated with a standardized phonological awareness scale consisting of 78 questions. The language test will be used for language assessment. Auditory evoked evoked late potentials will be recorded in a quiet room using the Neuron-Spectrum5 (4/EPM) (Neurosoft, Ivanoco, Russia) device.

b. Statistical methods envisaged to be used in the study

Statistical analysis of the results obtained will be made using IBM® SPSS® Statistics v24 (IBM, Armonk, New York, USA). After the normal distribution analysis of the results obtained, correlation analysis, inter-experimental, pairwise and triple statistical comparisons will be performed in accordance with the distribution of the data.

It was planned to use Mann Whitney U test for intergroup comparisons and Wilcoxon test for intragroup comparisons. The values obtained in the study will be presented as mean±standard deviation.

D. Protocol:

D.1. Work Start Date: March 2021

D.2. Duration of Study: At least 3 months

D.3. Locations of the Study: Istanbul University-Cerrahpaşa Medical Faculty Audiology and Speech Disorders Clinic

D.4. Study Coordinators:

Study Advisor: Ahmet ATAŞ

Study Coordinator: Büşra YILANLI

E. Project Achievements, Ethical and Legal Requirements:

E.1. Learning Outcomes: The effect of the Music Integration Phonemic Awareness program on the phonological awareness skills of pre-school (5-6 years old) cochlear implant users will be examined.

E.2. Informing the Ethics Committee:

E.3. Records Retention and Quality Assurance Measures:

All data obtained will be stored in accordance with the privacy policy. The data to be obtained will not be made public. In the data to be used in the study, the names of the individuals will be kept confidential.

The standard follow-up and treatment of the patients will not be affected by this study.

F. Resources

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3. <https://doi.org/10.1111/mbe.12016>
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9. Davis, Makenzie M. (2019). "Rhythms and Reading: Applying Literacy to the Music Classroom" Honors Theses. 613
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12. Moritz, C., Yampolsky, S., Papadelis, G., Thomson, J., & Wolf, M. (2013). Links between early rhythm skills, musical training, and phonological awareness. *Reading and Writing*, 26(5), 739–769. <https://doi.org/10.1007/s11145-012-9389-0>
13. Patscheke, H., Degé, F., & Schwarzer, G. (2016). The Effects of Training in Music and Phonological Skills on Phonological Awareness in 4- to 6-Year-Old Children of Immigrant Families. *Frontiers in psychology*, 7, 1647.
14. Pesnot Lerousseau, J., Hidalgo, C., & Schön, D. (2020). Musical Training for Auditory Rehabilitation in Hearing Loss. *Journal of clinical medicine*, 9(4), 1058. <https://doi.org/10.3390/jcm9041058>
15. Phelps, S. (2003). "Phonological Awareness Training in a Preschool Classroom of Typically Developing Children." *Electronic Theses and Dissertations*. Paper 772. <https://dc.etsu.edu/etd/772>
16. Saad, M., A. (2013). The Effectiveness of a Phonological Awareness Training Intervention on Prereading Skills of Children with Mental Retardation. *International Journal of Psycho-Educational Sciences*. Volume(2). 12-22. 10.14816/0023057.
17. Soleymani, Z., Mahmoodabadi, N., & Nouri, M. M. (2016). Language skills and phonological awareness in children with cochlear implants and normal hearing. *International Journal of Pediatric Otorhinolaryngology*, 83, 16–21. doi:10.1016/j.ijporl.2016.01.013