

Exploration of the Impact of Music Education on the Speaking and Hearing Abilities of D/deaf People

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Abstract: This paper reveals the influence of music education on D/deaf people's hearing and speaking abilities by analyzing the existing literature. Firstly, the importance of music education and related research background is introduced. Then, some methods and precautions to be used in literature analysis are explained. In the literature review, the methodology, sample characteristics, and main findings of different studies are compared and analyzed. Lastly, the paper puts forward some suggestions for further research and summarizes the important role of music education in the field of D/deaf people education and the future research direction.

Keyword: Music education; D/deaf learners; Auditory training; Hearing impairment; Sound perception; Inclusive education; Sensory integration

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1. Introduction

Music education has been an important research topic in recent decades, with positive effects on academic performance, cognitive development, and social-emotional learning^[1]. In addition, music education plays a key role in the field of special education, especially for students with hearing loss. Dating back to 1848, pioneers such as William Wolcott Turner and David Ely Bartlett wrote in the *American Annals of the Deaf* that hearing-impaired students could learn music, this has contributed significantly to the musical education of the deaf^[2,3]. Rhythm classes flourished in schools for the deaf in the 19th century, using rhythmic clapping, piano, drums, musical games, and imitative singing to train auditory skills and pronunciation^[4]. The enactment of the 1975 Education for All Children with Disabilities Act (EAHCA), which later evolved into the Individuals with Disabilities Education Act (IDEA), marked an important turning point. This legislation ensures that students with disabilities can receive appropriate education in a more inclusive environment, facilitating their integration into regular classrooms, including music lessons. Building on this progress, Paula and Pederiva found through research that music education enhances the sensory experience of deaf people and promotes a deeper

understanding and appreciation of music in ways that are acceptable to deaf people ^[5].

2. Methodology

In this paper, a systematic approach was used for literature collection and analysis. Literature searches were conducted in multiple scholarly databases, including Semantic Scholar, Connected Papers, Summit Keyword Graph, and Google Scholar. Among them, Connected Papers can show the positioning of a particular paper in the academic field and its relevance to other papers; Summit Keyword Graph provides a keyword-based visual exploration tool that provides insight into research trends and keyword vocabulary on a specific topic. In these academic databases, the search and selection of literature were centered on keyword groups such as “music education,” “D/deaf people,” “hearing ability,” and “speaking ability.”

In addition, when conducting a literature search, preference was given to recently published literature to ensure that it reflects current research trends and the latest findings. The scope of the study focused on relevant studies published between 2000 and 2024. The selection criteria were designed to target studies that directly explored the impact of music education on D/deaf people’s education, excluding studies that did not involve D/deaf people participants.

It should also be noted that in this paper, in addition to the objects studied in the literature, D/deaf people will be used to refer to people with different hearing levels. This allows D/deaf people to include a broad group of people who, despite differences in hearing levels, may benefit from music education. It is important to recognize that D/deaf people with different hearing levels may experience and respond differently to music education. Therefore, this paper will consider these differences and explore how music education can meet the needs of this diverse group and the potential impact of music education on their hearing and language development.

3. Literature review

3.1. Impact of music education on the hearing ability of D/deaf people

In terms of exploring the impact of music education on the hearing ability of D/deaf people, a total of three studies were analyzed in depth ^[6-8]. By comparing and connecting these three studies, the essays on the methodology and research design of each study were analyzed, thus highlighting the unique role of music education in improving the listening skills of D/deaf people.

Reifinger’s study adopted the methodology of literature review and systematic evaluation, focusing on exploring the impact of music education as an effective auditory training tool on children with cochlear implants. The main findings of the study include: music education not only improves the auditory abilities of children with cochlear implants but also promotes the development of their auditory skills, especially in speech recognition and pitch perception; singing activities in music education play an important role in language ability and music perception of children with cochlear implants. However, although Reifinger’s study provided insights into the use of music education in children with cochlear implants, its study design has certain limitations. The study used a short training period, which may limit a full assessment of the long-term effects of music education. To sum up, research by Reifinger showed that music education has a positive impact on promoting the development of hearing and music perception abilities of children with cochlear implants ^[8].

In the study by Rochette *et al.* ^[6], the research focused on exploring the impact of music education on the hearing ability, perception, and cognition of deaf children. This study compared profoundly deaf children who received music classes with those who did not receive music education and found that profoundly deaf

children who participated in music classes showed significant improvement in their auditory abilities, not only in the field of music but also in non-music-related auditory tasks. However, these advances also facilitated the development of hearing-related cognitive and language skills. Although the study provided a comprehensive assessment of the overall effects of music education, there are some methodological limitations to the study. The study had a small sample size, with only 14 profoundly deaf children having taken music lessons and 14 profoundly deaf children not attending music lessons. This may limit the generalizability of the findings. To sum up, the research by Rochette *et al.* showed that music education has a positive impact on the development of hearing ability, perception, cognition, and language skills of deaf children ^[6].

Comparing the studies by Reifinger and Rochette *et al.*, it was found that Reifinger used the methods of literature review and systematic evaluation to provide information on the impact of music education on the auditory and music perception abilities of children with cochlear implants. The study by Rochette *et al.* revealed the extensive impact of music education on the development of deaf children's hearing, perception, cognitive abilities, and language skills through actual comparative research. Although the two have differences in research methods, both emphasize the value of music education in the use of children with cochlear implants and deaf children.

Roman *et al.* focused on auditory training in cochlear-implanted children, particularly through the "voice of the hand" strategy to improve hearing and speech recognition ^[7]. The study involved 19 cochlear-implanted children and divided the participants into an experimental group that received training and a control group that did not receive training. The results showed that the experimental group showed significant improvements in auditory tasks and speech recognition, while the control group showed no significant changes. Research showed that this training has a positive effect on improving the hearing of cochlear-implanted children. Research has also found that early intervention is critical in the hearing development of these children. Although this study had certain strengths in design, such as the use of a control group and a large sample size, the study also demonstrated certain limitations, including not using a randomized controlled trial design, not assessing long-term effects, and lacking task-specific details. To sum up, the study by Roman *et al.* showed that auditory training has a positive impact on deaf children's auditory ability and speech recognition ^[7].

Compared with the first two studies, the study by Roman *et al.* focused on cochlear-implanted children, and the study showed that their auditory ability was improved by auditory training. This differs from the first two studies in that it focuses on auditory training rather than music education, which provides a contrasting perspective to the first two studies. This further emphasizes the importance of music education in improving the listening abilities of D/deaf people. Music education is a broader approach to education. In the studies of Reifinger and Rochette *et al.*, music education promoted auditory, cognitive skills, and language skills while also promoting musical interests, compared with single auditory training, music education provides a more diverse experience.

Overall, although the methods used in these three studies were different, they all highlighted the positive impact of music education on the hearing of D/deaf people.

3.2. Impact of music education on the oral language ability of D/deaf people

In terms of exploring the impact of music education on the oral language ability of D/deaf people, the following three studies with similar themes were analyzed respectively ^[9-11]. By comparing and connecting these three studies, the differences in methodology and research design of each study were analyzed to explore the unique role of music education in improving the oral skills of D/deaf people.

Silvestre and Valero's study explored the impact of music education on the spoken language acquisition of

deaf pupils in primary school education ^[9]. The study followed five deaf pupils who received music education in a mainstream school over a long period and compared them with a control group of deaf pupils who did not receive music education. The study found that the experimental group performed better than the control group in areas such as language, speech quality, and simple sentence structure. Overall, the study showed that music education at the primary education stage has a certain positive impact on deaf pupils' oral language acquisition, especially in terms of discourse organization, syntactic ability, and speech intelligibility. Although the study studied participants over a long period and added a control group, there were some limitations in the study's methodology. For example, the sample size of the study was small, which may limit the representativeness and generalizability of the findings. To sum up, the research by Silvestre and Valero showed that music education has a positive impact on the discourse organization, syntactic ability, and speech intelligibility of deaf pupils in primary education ^[9].

Fix's study explored the impact of music education on deaf and hard-of-hearing children ^[10]. The study investigated the exposure of children in oral schools to music in school by designing a questionnaire. The study found that most schools reported in the survey that they provide some form of music education in the school curriculum; most schools use music programs to help students develop language and auditory skills; students who participate in music programs are social and show positive changes in emotional behavior. These findings indicated that music education plays a crucial role in the development of deaf and hard-of-hearing children, not only promoting these children's communication skills but also having a significant positive impact on their overall development. There are still some methodological limitations in this survey study. For example, the data collection methods and measurement tools used in the study may not fully capture the characteristics or variables of the research object; the subjective bias of the researcher may affect the data analysis and interpretation process, thus affecting the objectivity and impartiality of the research. To sum up, the research by Fix showed that music education has a positive impact on the language, expression, and communication abilities of deaf and hard-of-hearing children ^[10].

By comparing the first two studies, it was found that although they both focused on the impact of music education on D/deaf people, their methods and focuses were different. By interviewing a small number of deaf pupils, Silvestre and Valero explored in depth the positive impact of music education on deaf students' oral acquisition, especially in terms of language and speech. In contrast, Fix's study analyzed the impact of music education on deaf and hard-of-hearing children in a broader context. Although the two studies differ in method and focus, both emphasize the importance and potential value of music education in the education of D/deaf people.

Nelson *et al.* explored the integration of music into language and literacy instruction, providing music instruction for deaf and hard-of-hearing children. The study discussed the beneficial aspects of integrating music into educational activities to enhance the hearing, speech, language, and literacy development of these children. In the article, Mrs. Adams found that Katie, a student with hearing loss, showed better language and literacy skills after adding music to her lessons. This suggests that music can have a positive impact on the spoken language skills of deaf and hard-of-hearing children. This research highlighted the huge potential of music as a tool to promote language development and literacy, particularly for deaf and hard-of-hearing children. The study demonstrated the effectiveness of incorporating music into educational programs to enhance language and literacy development in deaf and hard-of-hearing children. However, the study lacked detailed methodological details, limiting the ability to fully evaluate the study design and methods. To sum up, the research by Nelson *et al.* showed that music education has a positive impact on the language and literacy skills of deaf and hard-of-hearing children ^[11].

Compared with the previous two studies, the study by Nelson *et al.* focused more on the role of music in the language and literacy teaching of deaf and hard-of-hearing children. It highlighted the potential of music to promote language and literacy development in these children, but the lack of detailed study details and comprehensive assessments limits a comprehensive understanding of study design and methods.

Overall, although these three studies have differences in methodology and samples, they jointly demonstrate the positive impact of music education in promoting the development of language abilities of D/deaf people.

4. Suggestions for further research

Based on an in-depth understanding of the existing literature, particularly based on the studies by Reifinger, Rochette *et al.*, and Roman *et al.*, it can be concluded that music education has a positive impact on the development of hearing and speaking abilities of D/deaf people. These studies highlight the importance of early intervention, individualized education, and multisensory teaching approaches. Based on this, the following suggestions can be made:

First of all, we should develop a long-term music education plan for the D/deaf people. This program should begin early in their lives and continue through all stages of their development. Doing so ensures that D/deaf people receive appropriate support and stimulation during critical periods of language and hearing development, leading to better development of language skills and musical perception. Harrison *et al.* emphasized the importance of language learning in the critical period of language acquisition for D/deaf people, pointing out that early music education may have a significant impact on the language and hearing development of D/deaf people, given the close relationship between music and language ^[12].

Secondly, we should implement personalized music education plans for D/deaf people. Personalized education provides tailored teaching methods for D/deaf people to meet their unique needs and promote their academic performance, which can also enhance the understanding and identity of D/deaf people's culture. Thus, we can use their multiple senses in music education, such as vibrations transmitted through the floor or chairs. In this way, even if children cannot hear the music, they can experience it by seeing and feeling it ^[13].

In summary, these recommendations based on literature research, if implemented and maintained, may provide deaf children with a supportive and inclusive learning environment, which can help them learn and progress better.

5. Conclusion

This literature review reveals that music education has an important positive impact on the development of hearing and speaking abilities of D/deaf people. Through in-depth analysis of relevant literature, especially the research by Reifinger, Rochette *et al.*, and Roman *et al.*, we found that music education can effectively improve the auditory perception of these children, language understanding, and expression skills. By analyzing relevant research, we found that early intervention and continuous music education can significantly improve the auditory perception, language understanding, and expression abilities of these children. In addition, personalized and multi-sensory teaching methods have also been noted to have a positive impact on adapting to the unique needs of D/deaf people. However, there are some limitations to the current study, such as the small sample size and limitations of the study design. Therefore, future research should consider a wider sample and a more comprehensive research design to explore more deeply the long-term effects of music education on D/deaf people. To sum up, music education is not only an important part of the education of D/deaf people but also

a key factor in their all-round development and should receive more attention and application in educational practice.

Disclosure statement

The author declares no conflict of interest.

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