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Classical Music and Childhood Music Intervention on Moderate Alzheimer's Patients: Case Study

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Abstract

Alzheimer's Disease (AD) has become a major worldwide health crisis with increasing prevalence among the aging population. People with early stage Alzheimer's will continue to experience symptoms that progressively worsen as time goes on. Pharmacotherapy has shown its limited effectiveness in slowing down the development of symptoms, but non-pharma therapies such as music therapy have shown promise in assisting Alzheimer's patients to improve their quality of life. The goal of this study is to assess the effects of two genres of music interventions on an Alzheimer's patient's selective cognitive measures such as relational communication, the verbal and nonverbal aspects of how messages from the patient are conveyed. This paper presents the case of a 73-year-old patient with moderate Alzheimer's living at Memory Care Center at Fox Trail, Princeton, NJ. Music interventions were applied to slow the development of additional symptoms. His successful response to certain types of music inspired the author to continue Alzheimer's treatment using music interventions, and as a systematic controlled treatment for this condition. The different response after the periods of treatment using different types of music genres in a five-year period (2014-2019) may suggest the modality of certain genres of music interventions on this patient. The Individualized Music Therapy Assessment Profile (IMTAP) will be used to measure the patient's cognitive response. This study may lay the groundwork for future research on selective genres of music intervention in non-drug therapy for Alzheimer's patients, specifically music therapy.

Introduction

AD is a chronic neurodegenerative disease that usually starts slowly and gradually worsens over time. As their condition declines, many Alzheimer's patients often withdraw from family and society [1,2]. No treatments cure its progression, though some may temporarily alleviate symptoms.

The number of AD patients reached over 35 million worldwide in 2013 and is projected to triple by 2050 [3]. Music therapy can be an important low-cost method for improving the neuropsychological, cognitive, and social behavior goals of AD patients [4].

While there is a lack of pharma-therapy available, many studies have demonstrated that music therapy is beneficial to improve cognition and to reduce neuropsychiatric syndromes of AD [5]. This case study will present independent research regarding the effects of different genres of music intervention in treating Alzheimer's patients.

The Case Study Object

This paper presents the case of Donald, a patient with moderate Alzheimer's who was engaged in music interventions to slow the worsening of his AD symptoms.

The 73-year-old patient was born in New Jersey and educated in Ohio. After completing his Kenyon University education, Donald entered the sales business. He retired at the age of 60 years and currently lives in Memory Care Living Center at Fox Trails. Since the time of the beginning of this case study (2014), he has been ranked a 1 (mild dementia) based on the Clinical Dementia Rating scale [6].

The patient had early experiences with Classical Music. He took piano lessons for three consecutive years (1957-60) at the New School of Music in Princeton NJ and still plays classical and ragtime music on occasion at the nursing home. The patient has learned ragtime music in his childhood but not classical music, but He expressed enjoyment in listening to both genres.

Methods

The Music Therapy assessment in this experiment follows the standards put forth by the Individualized Music Therapy Assessment Profile (IMTAP), which is an intervention program developed by a registered music therapist at California State University. The intervention recommends the performer to facilitate a one-hour session with the patient weekly. Prior to being exposed to music, the patient always took a nap (Table 1).

The researcher plays music on the piano to the patient, who is observed closely. Data were collected before, immediately after, and a week after the patient was exposed to classical and ragtime music, with each genre's session ongoing for two weeks. This process was repeated five times, and the data below were the average over this five-year period (2014-2019). This assessment is used to determine the patient's cognitive measures, specifically relational communication and cognitive fundamentals according to the IMTAP definition [7].

Results

Post-intervention qualitative observation for each music genre

First week of classical music: The three movements of Beethoven's Sonata Pathétique were played for the patient. The patient has heard of this piece prior to this session. During the session, the patient moved spontaneously and sometimes displayed appropriate facial muscle movement. He never reached to play the instrument after the piece but established right hand dominance when sitting. There were unconscious body movements to the rhythm of the music in an organized manner. These movements are related to the musical stimuli. His head turned to the sound source and demonstrated strong awareness of the classical music. He did not appear to be aware when pitch and tempo change or are played incorrectly. The patient did not demonstrate awareness of changes in intensity/mood. After the piece, the patient did not express opinions about the music. When asked questions about his music experience, the patient provided little information and incorrect sequencing of events. By standards of the IMTAP "receptive communication/auditory perception", Don scored an average of 79%*.

Second week of classical music: The patient seemed to be more engaged this week with the same piece. The patient moved spontaneously and always displayed appropriate facial muscle tone. He never reached to play the instrument after the session but established right hand dominance when sitting. There were conscious body movements in tempo in an organized manner. These movements are related to the musical stimuli. His head turned to the sound source and demonstrated strong awareness of Classical music. He did not seem to be aware when pitch and tempo changed, or notes played incorrectly. He did not demonstrate awareness of changes in intensity/mood. However, he noticed transitions between movements, shown by clapping. After the piece, the patient did not express opinions about the music. When asked questions about his music experience, he provided little to no information and recalled incorrect sequence of events. By standards of the IMTAP "receptive communication/auditory perception", Don scored an average of 81%*.

First week of childhood music: "The Maple Leaf Rag" was played in this session. The patient is very familiar with this piece on a personal level. Not only does he know how to play it, but the piece is also the only piece he knows how to play in its entirety. The patient demonstrated strong awareness of the music by turning his head to the sound source and staring at the piano. He reached to play the instrument after the piece is finished by the performer. He displayed conscious body movements to the rhythm of the music. These movements followed musical cues and were related to the musical stimuli. The patient demonstrated awareness when tempo, pitch, dynamic, meter, and mood changed. He also expressed concern when notes were played incorrectly. He expressed strong interest in playing the piano after listening and recalled his childhood experience with the piece, which led him to recall more memory and correct sequencing of events. By standards of the IMTAP "receptive communication/auditory perception", Don scored an average of 89%*.

Second week of childhood music: The patient demonstrated strong awareness of the music by turning his head to the sound source and staring at the piano. He reached to play the instrument after the piece is finished by the performer. He displayed conscious body movements to the rhythm of the music. These movements followed musical cues

and were related to the musical stimuli. The patient demonstrated awareness when tempo, pitch, dynamic, meter, and mood changed. He also expressed concern when notes were played incorrectly. He expressed strong interest in playing the piano after listening and recalled his childhood experience with the piece, which led him to recall additional music experience and correct sequencing of events. By standards of the IMTAP "receptive communication/auditory perception", Don scores an average of 90%*.

Score range: 0-100%	Week 1	Week 2	Average
Relational Communication	69	69	69
Fundamentals	70	71	70.5

Table 1: Patient's additional measures of performance following Classical music. intervention (average of five sessions through five years). *Scores range from 0-100%. >81% means above average cognitive response.

Score range: 0-100%	Week 1	Week 2	Average
Relational Communication	82	80	81
Fundamentals	81	82	81.5

Table 2: Patient's additional measures of performance following Ragtime music intervention (average of five sessions through five years).

Discussion

The results in this case are similar to those of previous reports on music intervention, which often indicated that selective types of music intervention affect patients differently. In Don's case, he scored 12% higher in relational communication and 11% higher in fundamental cognitive assessment after ragtime music than classical music intervention. This difference appears to show the effectiveness of exposing the patient to his childhood music, or ragtime music, which seems to be a stronger stimulus than Classical music. The dramatic difference indicates the importance of music choice during the intervention to treat this Alzheimer's patient. The response to selective genres can generate greater stimulation in weekly sessions. To maximize the effectiveness of music intervention, more tests should be conducted to measure the effectiveness of other music genres (Table 2).

Conclusions

As noted by some studies, music from the same culture as the patient and musical pieces chosen by the patient seem to be more efficient in stimulating the patient's cognitive response than other kinds of music. Therefore, specific musical stimuli according to the participant's musical preferences seem to provide the most cognitive stimuli. Such individualized methods may optimize musical interventions. However, such methods may be hard to implement as they require more care and more cost. Therefore, the researcher recommends that future studies examine ways to improve the effectiveness of group therapy.

Donald's results provide encouraging support for the continual application of musical therapy. The findings encourage the researcher to choose specific genres of music for intervention, preferably childhood music, in treating Don. The treatment may be reliably and

quantitatively assessed through consistent behavioural observation. The findings here may lay the groundwork for future research regarding other genres of music intervention [8,9].

Acknowledgements

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