AUTISM – COMMUNICATION AND ENGLISH LEARNING THROUGH MUSIC THERAPY

AUTISMO – COMUNICAÇÃO E APRENDIZAGEM DE INGLÊS ATRAVÉS DA MUSICOTERAPIA

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ABSTRACT: During the last few years, the number of scientific research and awareness of autism has increased considerably and therefore various methodologies and therapies have been created so that people with autism can be more fully included in society. The decision to investigate autistic communication through the area of Music Therapy is based on the fact that music has proved to be a powerful tool that can facilitate the learning processes of children with autism. Music can enhance their social relationships, and words learned from songs can cross over into real-life applications (Reece, 2024). Therefore, this paper aims to analyze the benefits of Music Therapy and investigate how it can help them at school and through improved communication foster greater advancements in their learning process.
KEYWORDS: Music Therapy. Autism. Communication. Learning Methodologies.

RESUMO: Nos últimos anos, o número de pesquisas e a conscientização sobre o autismo têm aumentado consideravelmente e, consequentemente, muitas metodologias e terapias foram criadas para que essas pessoas possam ser incluídas plenamente na sociedade. Decidimos investigar a comunicação autista através da área da Musicoterapia porque essa provou ser uma ferramenta poderosa que pode facilitar o processo de aprendizagem de crianças com autismo. A música pode melhorar suas relações sociais, e as palavras aprendidas nas canções podem passar para a vida real (Reece, 2024). Por conseguinte, este artigo tem como objetivo analisar os benefícios da Musicoterapia e investigar de que forma ela pode ajudar autistas na escola e na comunicação visando promover melhorias no seu processo de aprendizagem.
PALAVRAS-CHAVE: Musicoterapia. Autismo. Comunicação. Metodologias de Aprendizado.

Introduction

Due to the expansion of scientific research, many people have discovered the diagnosis of autism, consequently increasing the incidence of autism in society. According to the Autism and Developmental Disabilities Monitoring (ADDM) Network, in 1990, the incidence was one child in every 2,500. Recent evidence, however, suggests that the incidence of Autism Spectrum Disorder (ASD) in the general population is now "one in 36" (Maenner *et al*., 2023, p. 4). Furthermore, "new patterns in ASD prevalence by race and ethnicity emerged, with children from groups with historically lower prevalence, including non-Hispanic Black and Hispanic

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children, and children in lower socioeconomic status (SES) neighborhoods having the highest prevalence" (Shaw *et al*., 2023, p. 4). According to the Centers for Disease Control and Prevention (CDC), the percentage of autism diagnoses among Asians (3.3%), Hispanics (3.2%), and blacks (2.9%) was higher than among white 8-year-olds (2.4%) in 2020.

As a result of this need, many methodologies and therapies such as Applied Behavior Analysis (ABA) (Foxx, 2008), Treatment and Education of Autistic and Communication Handicapped Children (TEACHC) (Virues-Ortega, Julio; Pastor-Barriuso, 2013), Son-Rise (Houghton *et al*., 2013), DIR Floor Time (Divya *et al*., 2023), and others were created, so that these children can be fully included in society. Now, we need to improve accessibility and inclusive programs in schools.

More awareness is required about what inclusion in the educational environment really means to promote truly effective learning for all. Autistics have different ways of learning, and teachers, as well as family members, need to understand this and try to adapt to their ways of living instead of demanding that they should fit into the world of non-autistics. There are several methods of teaching autistics, which may not work for all of them, but one method that has been widely applied and reported in several studies (Alvin, 1978; Ball, 2004; Brown, 1994; Brownell, 2002; Buday, 1995; Edgerton, 1994; Robarts, 1996) is Music Therapy, which has the power to promote interaction while stimulating people to have fun, as they learn through music. This has proved to be a powerful tool that can facilitate the learning process of many autistics. "Music can enhance social relationships for people with ASD and words learned from songs can cross over into real life" (Reece, 2024, online).

Once music has the potential ability to modify brain structure and increase connectivity among cortical regions, it fosters greater integration of sensory inputs during early developmental stages. This neurological effect suggests that exposure to music could lead to enhanced cortical activation in areas typically less active in children with autism, which is theorized to underlie the core neurophysiological differences associated with the condition (Sharma; Tarazi, 2018).

Additionally, music is widely applied across medical disciplines to address diverse physiological, psychological, and spiritual needs in adult and pediatric patients. Research spanning the past two decades has documented its therapeutic benefits in various medical contexts, including surgical (Bringman *et al*., 2009; Koch *et al*., 1998; Mok; Wong, 2003), cardiac (Hamel, 2001; Mandel *et al*., 2007), and oncology settings (Bradt, 2011; Bufalini, 2009), highlighting its potential as an anxiolytic intervention (Bradt; Dileo; Shim, 2014).

Besides having positive effects on several medical conditions, our emotions are often strongly influenced by the kind of music we listen to. Music has the power to increase the connectivity of neural networks and can even change the brain structure. It is therefore clearly the case that music therapy will be efficient in helping improve autistic socialization, communication, and learning processes (Srinivasan; Bhat, 2013).

According to this perspective, educators should consider Music Therapy as an ally, as it can contribute in many ways towards the success of the teaching-learning process. Due to the power of interaction this therapy has, teachers can use music to solve the main issues autistics have trouble with, namely social and communicative issues. Moreover, they can learn a new language, enabling them to understand the communication process more clearly, and even learn to play musical instruments, which will help develop their motor skills (Srinivasan; Bhat, 2013).

For this reason, this article aims to discuss the uses and benefits of music therapy for people with autism so that we can find a possibility to develop their communication as a way to include these people in society. To this end, we will use qualitative methodology by using a questionnaire with open-ended questions that will be answered by Music Therapy professionals, joining theory and practice together to learn more about the reality of applied music therapy and how it works and to discover what extent it might be helpful for autistics.

Another issue under investigation is whether it might be possible for autistics to acquire a second language through Music Therapy. We believe that by analyzing the answers through real-life experiences, combined with what we have been researching in theory, the results would be more measurable and convincing, once the participants live in the same context as the authors, that is, in the same country and culture, thus creating the opportunity to ask more personalized questions, according to specific areas of interest.

What is autism spectrum disorder (ASD) and how does it affect communication?

Autism is a complex neurodevelopmental disorder that often results in substantial hardships at individual, family, and social levels. The traditional core diagnostic and clinical features of ASD are weaknesses in social-communicative abilities and the presence of restricted interests and repetitive behaviors (Baum; Stevenson; Wallace, 2015). Autistics have difficulty communicating and interacting with other people and may also perform repetitive activities and movements. They get upset when something in their routine changes and can be emotional and sensitive to touch, specific textures, and noises. But as the name indicates, autism is a spectrum, that is, there are several kinds, as well as degrees, of autism.

Symptoms can differ in a wide variety of combinations, so not all autistics are, or behave, the same as others. For example, some of them are verbal (that is, they are able to speak), and others are non-verbal. Some are very quiet, and others are hyperactive. Then, if an autistic person can communicate, this does not mean that they are not autistic, and in the same way, if someone is hyperactive, this does not necessarily mean that they are autistic. There seems to be no known single cause for autism and as yet no cure for it, but the best way to help autistic children is early intervention, which should be carried out as soon as possible.

> Research has shown that early intervention can improve a child's overall development. Children who receive autism-appropriate education and support at key developmental stages are more likely to gain essential social skills and react better in society. Essentially, early detection can provide an autistic child with the potential for a better life. Parents of autistic children can learn early on how to help their child improve mentally, emotionally, and physically throughout the developmental stages with assistance from specialists and organizations like ASDF. (ASDF, 2012, n.p.).

If parents feel that there may be symptoms, they are advised to search for a doctor and start therapy if necessary. By doing this, the child will have the opportunity to lead a more independent life. Some examples of therapies include occupational, behavioral, and music therapy, which will be our focus in this paper. Therapy will help to stimulate brain areas that need to be activated so that various issues faced by autistic people can be improved. Studies (Schlaug, 2015) have been developed related to brain plasticity, which indicates different ways the brain can learn to change, and musical activity has proven to be a powerful stimulus in this area. According to Losardo, Mccullough, and Lakey (2016, p. 1),

> Neuroplasticity is the lifelong ability of the brain to reorganize as a result of experience. Specifically, Kleim and Jones et al. [3] define neuroplasticity as functional reorganization within neural tissue, mediated by changes in neural circuitry. Learning is the by-product of neuroplasticity. Said another way, neuroplasticity is experience-dependent, and behavioral training is key to promoting brain reorganization.

The effects caused by music include the restoration of sensory-motor networks, as well as stimulating positive influences on cognitive and emotional processes in healthy and neurologically disordered individuals. Various sensory-motor, coordination, or emotional disabilities can be improved with music-supported therapy (Altermuller; Schlaug, 2015).

Thus, according to Losardo, Mccullough, and Lakey (2016), we need to believe that autistics can learn new skills. The research related to this subject shows that brain plasticity is

crucial for all humans in general, including autistic people as well. Therefore, early intervention is extremely necessary. The more stimuli the child receives, the more synapses will be created and, consequently, the better the results can be, the more learning will occur. Therefore, Music Therapy can be an interesting possibility for autistics since they can receive new stimuli, which will trigger the learning process (Ke *et al*., 2022).

Unfortunately, in Brazil, people with autism and their families still face some difficulties regarding accessibility to social life and, even worse, to inclusive education at a regular school (Carvalho, 2006). As a result, these people may lose the opportunity to discover and stimulate their skills. According to Rosa (2008, p. 215),

> Some believe that students with disabilities are more likely to be excluded in regular schools because they can't keep up with their peers' learning, and that they should therefore be kept back and attend special schools, where they will be with “equal” children and therefore won't have to deal with this challenge. Other educators believe that students with special needs should attend regular school, precisely because of the richness that comes from diversity[3].

The topic of inclusion has been discussed for a long time because it is an issue that is not easily solved. There are many challenges related to the accessibility of people with disabilities. For example, it is often necessary to make changes and adaptations to the school infrastructure, classroom organization, support system, and teaching methodologies to be able to promote a strong awareness of learning diversity inside the classroom – not only related to people with disabilities, but people from different cultures as well. In this sense,

> […] the teacher also needs to have the sensibility to see the student as a person who needs their help and so do the other students. That's why interaction activities can be important, not least so that the others can see what's different about their classmate. We need to work on the issue of difference and respect between people (Feijó, 2017, p.13)[4].

All children need to see that not everybody learns the same way as others. In that sense, autistics learn in different ways. In this case, there is a need to create classes where they can

[3] Translated by the authors. In the original: “Alguns acreditam que o aluno com deficiência é mais excluído na escola de ensino regular, por não acompanhar os demais colegas na aprendizagem e por isto deveria ser preservado e freqüentar a escola especial, onde estaria com crianças "iguais" e, assim, não precisaria lidar com este desafio. Outros educadores acreditam que o aluno com necessidades especiais deve freqüentar a escola de ensino regular, justamente pela riqueza que surge através da diversidade”.

[4] Translated by the authors. In the original: “o professor também precisa ter a sensibilidade de olhar para o aluno como uma pessoa que precisa do seu auxílio e os outros alunos também. Por isso, atividades de interação podem ser importantes, até para os outros perceberem o que há de diferente no colega. É preciso trabalhar a questão da diferença e respeito entre as pessoas”.

feel included and respected. At the same time, the teacher must teach the students that all children are different from each other and this is normal, and we need to respect each other, independently of our differences. As Santos (2003, p. 56) claims:

> We have the right to be equal whenever difference diminishes us; we have the right to be different whenever equality decharacterizes us. Hence the need for an equality that recognizes differences and a difference that does not produce, feed or reproduce inequalities[5].

Dealing with diversity openly in the classroom should promote reflection, foster a sense of empathy, encourage open-mindedness, and stimulate the development of new perspectives, inspiring students to feel unique by being different. According to Bereta and Viana (2014, p. 125):

> Inclusion also affects other students without disabilities, as they learn to deal with the "different", put aside their prejudices and accept people as they are. They become more tolerant, supportive, and committed to others, and help whenever necessary[6].

Another issue we have to be conscious of is that autism should not necessarily be viewed as a disability, it should be seen as representing different kinds of abilities since autistics have different types of intelligence. Teachers and families need to comprehend and support their way of living, which includes their diverse ways of thinking, learning, behaving, etc. That is why it is so important to learn how to work with this group: they have much to offer society, and we can learn so much from them. Therefore, as teachers, we can try to provide the necessary support to help students with autism enhance their skills and make them believe they are skillful (Salah *et al*., 2023). But most importantly, we need to believe in them.

What are the benefits of Music Therapy for children with autism?

Music Therapy involves melody, rhythm, as well as the exploration of sounds in general, and includes a variety of activities, such as listening to melodies and playing instruments, therefore it is a good way to get children's attention. Music therapy can help autistic children

[5] Translated by the authors. In the original: "temos o direito a ser iguais quando a nossa diferença nos inferioriza; e temos o direito a ser diferentes quando a nossa igualdade nos descaracteriza. Daí a necessidade de uma igualdade que reconheça as diferenças e de uma diferença que não produza, alimente ou reproduza as desigualdades".
[6] Translated by the authors. In the original: "A inclusão também afeta os outros alunos sem deficiência, pois eles aprendem a lidar com o "diferente", deixam os preconceitos de lado e aceitam as pessoas do jeito que são. Eles passam a ser mais tolerantes, solidários e comprometidos com o próximo, e ajudam sempre que necessário".

to improve their social interaction, verbal communication, and social-emotional reciprocity (Sharma; Tarazi, 2018). In this sense, Short (2018, n.p.) states that:

> Another hypothesis is that music can teach individuals with autism new words and social constructs. While this idea is less studied than concepts like AMMT [Auditory-Motor Mapping Training], the idea behind it is that if an autistic individual listens to music a lot, they'll start to pick up on words and messages within the lyrics.

Many studies prove that music can help some non-verbal autistics learn and recall words from songs. Musical practice itself modifies the brain in anatomical and physiological terms. The repetitive beat associated with specific kinds of music has been shown to reduce or extinguish undesirable pathological behaviors such as isolation, hyperactivity, self-aggression, stereotyping, emotional tension, language disorganization, and anxiety (Sá, 2003) by everyday social musical activities or even through the playing of instruments. However, professionals have to make sure the practice is enjoyable as well as relaxing and not stressful.

According to Sharma and Tarazi (2018, n.p.): "The Cochrane Collaboration provided evidence that music therapy may help children gain improved function in the core domains of autism: social interaction, verbal communication, initiating behavior and social-emotional reciprocity." Reece (2024, p. 144) claims there are three possible neurological reasons regarding the effects of music on the development of speech and language:

> Firstly, music and language may share neurological resources, and that exposure to and involvement in music might increase the connectivity of the neural networks involved in the encoding of language. Secondly, the presence of music, or singing as opposed to speaking, may have an arousing effect within the autonomous nervous system. Finally, due to the unique way in which some children with ASC process sound, they may have a natural affinity with music; thus, through a process of association, words have a higher (or more coherent) perceptual profile when linked to melody.

When children have the opportunity to play music and sing along while working in a group, this may improve their sense of collaboration, which may also help enhance their communication process as they interact with each other and learn the lyrics. "A 2009 study utilizing music-based intervention reported that nonverbal children with autism were able to speak after undergoing auditory-motor mapping training" (Sharma; Tarazi, 2018, n.p.).

Music Therapy can help autistics enhance their social skills by developing activities that are appropriate for working in groups, as long as each person is welcomed as a unique individual

with distinctive characteristics. However, it is important to remember that not all autistics like to interact with other people, so it is a process that must be developed to help them socialize.

One aspect that should be highlighted is that teachers and therapists are frequently working with children who not only have autism. Many autistics are dealing with other pathologies at the same time, such as aphasia and other mental disorders like schizophrenia and anxiety. But once again, Music Therapy can be used to treat each individual in the best way possible. It is crucial to remember that autism is not the same for everyone, and there is no stereotype. Thus, the work accomplished should necessarily respect and take into account each person's individuality.

Besides social skills, Music Therapy can stimulate autistic people's physical movements. Music stimulates body movements by encouraging dancing, running, and jumping, as well as active participation in musical performances. One important set of tools used in this type of therapy is based on the use of percussion instruments, although it is possible to focus on timing while clapping your hands or stamping your feet. The use of synchronized percussion helps to promote attention, improve memory, and stimulate movements of the hands, arms, legs, feet, and other body parts.

Of course, several other learning possibilities can be explored. For example, while playing "*Siga o Mestre*" (Simon Says), autistics can play with a variety of musical instruments while stimulating their perceptive and visual memories by watching what Simon is doing, memorizing the actions and then repeating the movements, melodies or rhythms in a similar way. This can be an interesting way to identify specific neurological issues. For example, if the child cannot reproduce alternating movements, comprehend orders, or even differentiate the sides of the body by playing these games, teachers and therapists will become more aware of these details.

Those activities offer excellent opportunities for autistic children to feel more secure in the school context and with other interactions in general, as they require collaboration and interdependence between other colleagues. When children do not feel secure within the school environment, it can be difficult for them to interact, which can make communication more complicated.

Methodology

In order to discover more about key issues approached in the classroom context of special education, we elaborated a questionnaire to be answered by a group of Music Therapists

who work with autistics — since the focus of this paper is to help autistic children to stimulate their social and communicative skills through Music Therapy. Theory and practice were joined together to learn more about the reality of applied music therapy and how it works and to discover to what extent it might be useful and helpful for autistics.

Another issue under investigation was whether it might be possible for autistics to acquire a second language through Music Therapy. Thus, by seeking answers through real-life practice, the results would be more measurable and convincing since the interviewed professionals live in the same context as the authors, that is, in the same country and culture, thus creating the opportunity to ask more personalized questions, according to specific areas of interest.

Music Therapy can be easily accepted as part of the lives of autistic children since it helps develop social skills, which is one of the main difficulties related to autism. Therefore, we used the qualitative research method to obtain information based on more tangible experiences through open-ended questions since, as O´Brien *et al*. (2014) state, the purpose of qualitative research is to understand the perspectives and experiences of individuals or groups, as well as the contexts in which these perspectives or experiences are situated.

In qualitative research, using open-ended questions is pivotal, as it allows respondents to articulate their thoughts and perspectives on a given topic freely. As described by Fauvelle (2019), such questions are non-directive, contrasting with closed-ended questions, and enable respondents to communicate in their own words, directing their responses at their convenience (Roulston, 2008).

When using the qualitative method, the focus is on authentic experiences. Therefore, we used qualitative research based on open-ended questions so that it would become possible to see in more detail how these experiences work more realistically. In this sense, Creswell (2013, p. 194) states that:

> Giorgi (2009), also a psychologist, provides an analytic approach similar to that of StevickColaizzi-Keen. Giorgi discusses how researchers read for a sense of the whole, determine meaning units, transform the participants' expressions into psychologically sensitive expressions, and then write a description of the "essence".

Therefore, we asked three participants to answer nine questions, which included personal information such as age, qualifications, and experience, as well as details related to what they do as music therapists, the age groups they work with, whether their work is carried

out in groups or individually, and if they have any experience or knowledge related to teaching a foreign language to autistics. By adopting this method, it is easier to explore the information obtained in a more malleable way and it is possible to maintain the focus by avoiding questions or responses unrelated to the main topic.

The questions used in the questionnaire were asked as the following: (1) What is your age group (25–35, 35–45 or over 45)? (2) Write a little about your qualifications and experience related to music therapy (3) Have you worked with children with autism? Individually or in groups? How old were the children? (4) How does autism affect general communication? Can you add some examples to illustrate this? (5) What are the benefits of Music Therapy for children with special needs? (6) How can music therapy contribute to more effective communication in children with autism? (7) What would be the negative or positive effects if an additional language were included in the teaching-learning process for autistic children? (8) If the additional language was introduced in conjunction with music therapy, what would be the possible benefits for children with autism? (9) What are the most appropriate or effective music therapy techniques or methods that could facilitate the learning of an additional language?

Data analysis and discussion

To strengthen the arguments presented in the previous sections, I decided to interview three music therapists who had experience with autistics, working both individually and in groups. In this chapter, we will see in detail what they have to offer to autistics through music therapy. We used the qualitative method to provide a more in-depth and accurate analysis.

We prepared a questionnaire with nine questions for the therapists asking about their experience as related to music therapy, autistics, communication, and the teaching of a foreign language, in this case, the English language, in order to explore connections to the content analyzed for this research. In the following paragraphs, the most relevant answers to each question will be analyzed. To ensure their privacy, the ethical procedure we chose to follow in this article was to anonymize their names, replacing them with Participant 1, Participant 2, and Participant 3.

To begin with, the most common problems faced by autistics, as mentioned by the therapists, are vocalization, interaction, and some may even be non-verbal. Participant 1 and Participant 2 (2021) made the following comments:

> Patients with autism often have some difficulty with speech and vocalization. For example: dyslalia, dysarthria and aphasia. Some patients can barely babble or even make a sound. But it's worth pointing out that not all children with ASD have these speech difficulties. Many of the patients I work with speak normally and don't have any verbal difficulties. This can vary depending on the degree of autism the child is diagnosed with (Participant 1, 2021).

> […] The way the child communicates will depend very much on the degree to which they are at. It can be totally non-verbal or verbal. Both have difficulties with social interaction. Many over time (after many therapies) manage to interact (Participant 2, 2021).

When these children are diagnosed with pathologies that imply an intervention in the communication sphere, they may have difficulty understanding and making others understand information. A typical child usually acquires language through socialization; thus, an autistic child will also require socialization. Nonetheless, due to their disadvantage in social skills, interaction periods are needed in which special reinforcements are used to stimulate the reciprocity of the autistic child to facilitate communication.

Interaction stimulates their capacity to develop more successful communication, providing them with more autonomy, thus leading to a better quality of life. So, while autistic people may seem to prefer a practical and direct way of communicating, it is essential to provide them with opportunities to develop their communication skills in a way that meets their individual needs. “Autistic people generally don't seem to want to communicate the way people do. They are practical. They say what's necessary, when it's necessary. That's it” (Participant 3, 2021).

Several autistics, although they communicate, do not show interest in doing so. In some cases, the lack of response from autistic children is often due to a lack of understanding of what is demanded of them. They have their way of expressing themselves, which we need to comprehend. Hence, the importance of intervening in order to show them why socialization is important and how to do it more effectively by creating different situations in a variety of social contexts to encourage their response, enabling a healthy exchange of communication where both participants, sender and receiver, understand the message correctly.

As we have seen in previous sections of this paper, Music Therapy can produce considerable changes when it comes to interaction. As Muszkat (2019) mentions, musical experience structurally modifies the brain. This author was mentioned by one of the participants in one of their answers about the benefits of Music Therapy for autistics:

> Regarding neurodevelopmental disorders, it has been reported that in children with Autism Spectrum Disorder (ASD), music listening and music therapy minimize motor rituals, facilitate selective attention and exploratory behavior motivated by the positive effects of activating areas of the reward system, and modulate pre-motor regions (Muszkat, 2019, p. 240)[7].

Many of these points were mentioned frequently by the therapists in their answers. Below, there are answers from two different therapists, which show that even though they have no connection with each other, they both produced similar responses, for example, highlighting having experienced proof that Music Therapy can, indeed, make a significant impact on communication. The following quotes were given as answers to the question about ways in which Music Therapy could contribute to more efficient communication:

> Today we know that music stimulates both sides of the brain, including language. Music therapy will thus work according to the patient's needs. Many may need to work on their motor skills (gross and fine psychomotor skills), imitation, body schema, verbal and non-verbal communication, social interaction, emotion, auditory perception, imagination, shared attention, anxiety, irritability […] as mentioned above [in a previous comment] by neurologist Mauro Muszkat, music stimulates linguistic functions, which stimulates communication (Participant 2, 2021).

> Regulation of sensations, […] verbal development, artistic development, expansion of communication channels […] (Participant 3, 2021).

Music enhances motivation, communication, and social interaction skills, in addition to sustaining and developing attention, which can promote appropriate and meaningful interpersonal relationships, besides musical skills. As Sampaio, Loureiro and Gomes (2015, p. 149) state: "it can be considered that not only would the patient show improvements in areas of non-musical development, but they would also develop musical skills, although this is not the primary objective of music therapy[8]".

Several autistics are considered antisocial, but this may be due to the difficulty they have in expressing themselves. They can listen to a word and be unable to understand its meaning in a certain context, as well as using a word without really understanding what it means, thus making them weak in communication skills. These difficulties are not isolated, and they are

[7] Translated by the authors. In the original: "No que se refere aos transtornos do neurodesenvolvimento, tem sido relatado que, em crianças com transtorno do Espectro Autista (TEA), a audição musical e a terapia com música minimizam rituais motores, facilitam a atenção seletiva e o comportamento exploratório motivado pelos efeitos positivos de ativação de áreas do sistema de recompensa, e modulam regiões pré motoras".

[8] Translated by the authors. In the original: "pode-se considerar que não apenas o paciente apresentaria melhoras em áreas do desenvolvimento não-musical como, também, desenvolveria habilidades musicais, embora este não seja o objetivo primário da musicoterapia".

accompanied by determined behaviors, such as aggression, crying, and self-aggression, which might alternate with laughter, shouting, etc., and may also be considered as a form of communication that they are trying to use, despite not being socially conventional.

With musical practice, it is believed that these people become able to express themselves better, as Muzkat (2019, p. 235) states:

> […] musical sensory perception takes place in the projection areas located in the temporal lobe in the so-called auditory cortex, or primary auditory area, responsible for decoding pitch, timbre, contour and rhythm. This area connects with the rest of the brain in round-trip circuits, and with memory areas such as the hippocampus, which recognizes the familiarity of thematic and rhythmic elements, as well as with motor and emotional regulation areas such as the cerebellum and amygdala (which attribute an emotional value to the sound experience), and a small nucleus of gray matter (nucleus accumbens) related to the sense of pleasure and reward. […] Children generally express their emotions more easily through music than through words[9].

Since most autistics do not know how to communicate conventionally, the role of Music Therapy is to guide them toward a more socially acceptable type of communication. Therefore, it is crucial to provide these children with appropriate environments for interaction because as they interact with other speakers, language is acquired and improved. When asked about ways in which Music Therapy could contribute to more efficient communication, the Participant 3 answered as follows:

> Investing in physical, interactive and receptive stimulation. This is extremely important, because even though most autistic people don't seem to want to verbally communicate very much, when they do, they need to know how and in what way. In addition, they will need to know the phonemes, construct arguments, ask questions, request, interact at some point (Participant 3, 2021).

To stimulate communication, Music Therapy uses rhythm. For example, the therapist may create a musical game in which the music therapist and the patient sing a song, stimulating vocalization by the repetition of syllables during the songs that are being played and reproducing the movements required, such as clapping hands alone, clapping with each other,

[9] Translated by the authors. In the original: "a senso-percepção musical, se dá nas áreas de projeção localizadas no lobo temporal no chamado córtex auditivo, ou área auditiva primária, responsável pela decodificação da altura, do timbre, do contorno e do ritmo. Tal área conecta-se com o restante do cérebro em circuitos de ida e volta, e com áreas da memória como o hipocampo, que reconhece a familiaridade dos elementos temáticos e rítmicos, bem como com as áreas de regulação motora e emocional, como o cerebelo e a amígdala (que atribuem um valor emocional à experiência sonora), e um pequeno núcleo de substância cinzenta (núcleo accumbens) relacionado ao sentido de prazer e recompensa. […] As crianças, de maneira geral, expressam as emoções mais facilmente pela música do que pelas palavras".

and clapping other parts of the body, with both participants positioned facing each other. The movements are performed following the recurrent timing of the rhythmic pulse, stimulating communication since the therapist gives the command, which the patient follows by reproducing the gesture, also developing motor skills related to the movements required.

Once the patient has learned the first song, the therapist can start to vary and explore new situations to develop interaction, focus, readiness for a response, and language. These variations can involve speed or tone and movements, taking care that the changes are in accordance with the patient's condition. At all times, the therapist must recognize the context and assess which interventions are appropriate and necessary to achieve the desired goal.

Furthermore, it is crucial to combine repetition and variation, as well as familiarity and surprise, throughout the treatment since it is common for autistics to prefer familiar routines. According to Sampaio, Loureiro, and Gomes, (2015, p. 160), "repeating an experience is important for building memory, but it shouldn't always be repeated in the same way, otherwise a new autistic ritual could be introduced or an existing one reinforced".

Having discussed communication in their mother language, we are now going to investigate more deeply to discover how music therapy can expand communicative possibilities in a way that autistics can acquire an additional language, such as English.

On the bright side, additional languages have been found to promote increased brain activity. Thus, it is clear that adding a second language may be a positive factor in autistics' cognitive and social development, as well as providing them with improved progress in language and communication. When asked about what the effects would be if an additional language was included in the autistic's teaching-learning progress, the Participant 3 (2021) answered as follows:

> Positively, it offers another communication channel. Phonemes in other languages change. Sentences and thought structures are also different. This may be of interest to some autistic people, just as it is to many others. From this process, comparisons and associations can arise, and one language can enhance the others. […] Musical practice or simply musical appreciation are actions that require intense brain activity which, the more it is developed and/or stimulated, together with other practices such as singing in another language, for example, can make a strong contribution for autistic children (Participant 3, 2021).

One of the common ways we use to learn a language is through music. By repetition of words, we learn how to pronounce them or what they mean. Especially for autistics with echolalia, this might be an excellent opportunity to work with this issue in their favor since

echolalia is one of the characteristics of the process of language acquisition and is defined by Kanner (1946) as the rote and literal repetition of the speech of others. According to Roberts (2014, p. 55), echolalia,

> […] the immediate or delayed repetition of the speech of another, is associated with autism. Echolalia is usually described as a non-functional self-stimulatory or stereotypical behavior, despite research and theory suggesting echolalia has several functions for people with autism and may also be important in language development.

Some consider the characteristic of repetition to be a negative habit. However, therapists may use this in their favor by working with singing during music therapy since the repetition of words in a song may help autistics acquire them in the lyrics. Moreover, by combining lyrics with choreography or gestures, they will relate these movements to the meaning of the words being sung.

> Thinking of patients with high-functioning ASD in adolescence, one of the techniques would certainly be "singing", among others. An interest in international music would facilitate an interest in lyrics, which music therapy could work on (Participant 2, 2021).

For example, if the therapist is singing the song "Head, shoulders, knees and toes" and pointing to the part of the body they are singing about, then the patient will understand what they are talking about. If the therapist sings "If you are happy and you know it" while making a happy face and using a happy rhythm, the patient will know that the song talks about something happy.

Because of the repetition of these words, autistics may not only achieve the acquisition of words but also know what they mean and when to use them. Furthermore, autistic people demonstrate greater pleasure because of the interest generated by singing and listening to the songs they like, which makes the combination of music, language, and gestures even more helpful by stimulating a more active involvement in the acquisition of the language they are being exposed to.

In addition to what Participant 2 (2021) said about singing, Participant 3. agrees when she says: "The techniques most commonly used in music therapy are improvisation, listening, composition and musical recreation (reproduction). I believe that the most appropriate techniques for children would be playing and listening" (Participant 3, 2021). One of the main characteristics of Music Therapy used for autistic children is vocalization, based on the

repetition of syllables and other sounds in songs to stimulate and practice vocalization. One of the techniques applied is called Musical Speech Stimulation (MUSTIM), used mainly in cases of aphasia and apraxia, as explained below by Thaut and Hoemberg (2014, p. 829):

> Musical speech stimulation (MUSTIM) is the use of musical materials such as songs, rhymes, chants, and musical phrases simulating prosodic speech gestures to stimulate nonpropositional speech. MUSTIM uses completion or initiation of over-learned familiar song lyrics, association of words with familiar tunes, or musical phrases to elicit functional speech responses […].

Some autistics may already know many songs, but they may not know what they mean. Thus, therapists can use songs to create meaning for them and encourage them to reproduce the lyrics. When it comes to Music Therapy for language stimulation, therapist Participant 1 states the following:

> In terms of language, we use Musical Speech Stimulation (MUSTIM), one of the techniques applied in Neurological Music Therapy. This technique works on vocalization, using melodic structures. It would be interesting to combine MUSTIM with the new language, stimulating the new sounds of the additional language (Participant 1, 2021).

Thus, MUSTIM will lead the patients to develop a communication impulse because it stimulates spontaneous speech. Since they have the chance to get to know the phonemes and the words through familiar songs, this facilitates the therapeutic bond and communication through musical vocalizations. Another technique applied in Music Therapy is Developmental Speech and Language Training Through Music (DSLM), in which therapists use songs and related materials to improve and facilitate speech, assisting in language development. Thus, DSLM, according to Thaut and Hoemberg (2014, p. 825), is:

> […] a Neurologic Music Therapy (NMT) technique which uses developmentally appropriate musical materials and experiences to enhance speech and language development through singing, chanting, playing musical instruments, and combining music, speech, and movement.

This technique can help autistics to formulate phrases expressing opinions or basic needs. Therapists can use pictures with sentences that can be used to ask for water, food, and other basic needs and formulate songs for each image, asking the patient what each figure means and what the corresponding song is about. Moreover, we asked participants to explain how a second language could be introduced to autistics safely and efficiently. According to Participant

3 (2021), it is important to be aware of both the positive and negative aspects for autistic children to be introduced to an additional language: "Negatively, it could be an excess of stimuli and information, overloading them and/or generating stress".

At this point, it is essential to highlight the importance of encouraging the definition of a specific amount of time for rest and leisure as a significant aspect of learning. All types of stimulation should be controlled to avoid causing adverse effects on the learning process. Overstimulation may affect the patients' progress and even create more serious problems. Still about this topic, Kaim (2010, n.p.) states that:

> Overstimulation (OS) occurs when there is "too much" of some external stimulus or stimuli for a person's brain to process and integrate effectively. This leads to an unpleasant sensation of being flooded and an impulse to escape the stimulus — or, failing that, to cry or scream or thrash about. Overstimulation is a form of pain.

Thus, when talking about practicing different types of therapy, or talking about Music Therapy and adding a second language, it is important to respect the pace of the patients involved, giving them space to breathe and rest. Here, one of the participants highlighted a healthy way to add a second language for autistics:

> It would be interesting to add elements of the new language during the sessions, so that the child becomes familiar with the new language. By working together and adding elements of the new language, the benefits will be positive, not only in terms of vocalization and language, but also in understanding the new grammar, differentiating one language from the other, and emitting the sounds and phonemes of both languages (Participant 1, 2021).

There are therefore many positive aspects related to Music Therapy, but it is essential to take one step at a time. This way, the brain will be prepared to receive further stimulation, and patients can effectively learn better and apply their knowledge as part of their routine.

Conclusion

Autistics have several skills and ways of learning that are not frequently explored and are not even identified or used effectively. We need to adapt ourselves to their way of life rather than requiring them to fit into our world. We need to break the paradigm that people with disabilities are not capable. We need to believe in their potential because, if we do not, they will lose belief in themselves.

Music Therapy has many positive aspects and should be incorporated into the routine of autistics. Hopefully, this paper has provided greater visibility related to the effectiveness of this therapy in the lives of autistics and their families, offering hope and proposals for social inclusion. Of course, there is a long way to go, and this journey encompasses public policies and fights for rights until it becomes a reality.

But for now, as society becomes more and more aware of the importance of music as a means of communication for people who face serious difficulties in communicating with others, it may be possible in the future to live in a society where diversity coexists in harmony, where learning develops in a collaborative and respectful way aiming for maximum growth for every individual, thus contributing to the improvement of the quality of education, which is a constitutional right for all, including autistics.

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