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Children with neuropsychomotor development delay: music therapy promoting quality of life

Crianças com retardo do desenvolvimento neuropsicomotor: musicoterapia promovendo qualidade de vida
Niños con retraso del desarrollo neurológico: musicoterapia promoviendo la calidad de vida

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RESUMO

Objetivo: identificar a influência da musicoterapia no comportamento e qualidade de vida de crianças portadoras de retardo do desenvolvimento neuropsicomotor (RDNPM). **Método:** pesquisa experimental, com aplicações de musicoterapia (em um grupo de crianças) realizada na associação especializada em Cruz das Almas - Bahia, composta por 17 crianças portadoras de RDNPM com idade entre 5 a 12 anos. Foi observado o comportamento das crianças envolvendo aspectos emocionais, físicos, sociais e escolares. **Resultados:** houve evolução em todos os aspectos, sendo esta melhora significativa para os domínios Capacidade Emocional e Capacidade Escolar, mostrando os efeitos benéficos da musicoterapia. **Conclusão:** a terapia através da música torna-se uma opção de tratamento para crianças com RDNPM, melhorando a sua qualidade de vida.

Descritores: Musicoterapia; Retardo Mental; Qualidade de Vida.

ABSTRACT

Objective: to identify the influence of music therapy on the behavior and quality of life of children with neuropsychomotor development delay (NPMDD). **Method:** experimental research, with applications of music therapy (in a group of children) held in the specialized association in Cruz das Almas - Bahia, composed of 17 children with NPMDD aged 5 to 12 years. The behavior of children involving emotional, physical, social and school aspects was observed. **Results:** there was an evolution in all aspects, being this improvement significant to Emotional Capacity and School Capacity domains, showing the beneficial effects of music therapy. **Conclusion:** music therapy becomes a treatment option for children with NPMDD, improving their quality of life.

Key words: Music therapy; Mental Delay; Quality of life.

RESUMEN

Objetivo: identificar la influencia de la musicoterapia en las alteraciones de la calidad de vida en niños portadores de retardo del desarrollo neuropsicomotor (RDPM). **Método:** se trata de pesquisa experimental con aplicaciones de musicoterapia realizada en una asociación especializada en la ciudad de Cruz das Almas - Bahia, compuesta de 17 niños portadores de RDPM con edad entre 5 y 12 años. Ha sido observado el comportamiento de niños, involucrando aspectos emocionales, físicos, sociales y escolares. **Resultados:** hubo evolución en todos los aspectos, con mejoría significativa para Capacidad Emocional y Escolar, mostrando los efectos benéficos de la musicoterapia. **Conclusión:** la terapia através de la música se vuelve una opción de tratamiento para niños con RDPM, mejorando así la calidad de vida.

Palabras claves: Musicoterapia; Retardo Mental; Calidad de Vida.

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INTRODUCTION

Music is a combination of rhythmic, harmonic and melodic sounds used by many people throughout history. Music therapy is defined as a systematic intervention process that helps to promote the health of the patient through musical experiences. The use of this therapy improves the relationship of communication, expression, organization, learning and mobilization, reaching a better therapeutic effect, regarding the achievement of physical, emotional, mental, social and cognitive needs⁽¹⁾. Musical stimuli can also change breathing, blood flow, heart rate, blood pressure, metabolism acceleration, and oxygenation. They can also reduce fatigue, promote muscle tone, increase attention and stimulate the memory, and reduce the pain sensory stimuli. These stimuli become useful in the treatment of psychosomatic, physical and emotional disorders such as anguish, anxiety, tension, stress and fear⁽²⁻³⁾.

Among many benefits, the potential of music therapy is believed to promote an increase in the quality of life (QOL). The term QOL is understood as an eminently human notion, which is approximated to the level of satisfaction found in family, love, social and environmental life. The improvement in quality of life has become one of the expected results, both in the assistance practices, and in the public policies in the fields of health promotion and disease prevention⁽⁴⁾.

Nursing professionals have been exploring various therapeutic modalities in the performance of their professional activity. Studies claim that the union of Nursing and Music therapy, as adjuvant therapies for several treatments, may offer a more humanized assistance, improving the relationship between staff and patient and the relationship of the multidisciplinary staff of the healthcare area itself. In addition, it is a way of learning and of education for the staff and the patient⁽²⁾.

In recent years, some studies involving music therapy and nursing have contributed to a better understanding about the benefits of music therapy. However, few studies are directed to the quality of life provided by music, and few address the relationship of music therapy with children with neuropsychomotor development delay.

The Neuropsychomotor Development Delay (NPMDD) is a neuropsychiatric disorder common in children and adolescents. It is difficult to be defined, as it varies according to the adopted benchmark - neurological, psychological, speech therapies or others. The essential characteristic of NPMDD is when a person has an intellectual functioning significantly below the average. It occurs accompanied by significant limitations in the adaptive functioning in at least two of the following skill areas: communication, self-care, domestic life, social skills, interpersonal relationships, use of community resources, self-sufficiency, academic skills, work, leisure, health and safety. This concept may vary depending on the adopted benchmark⁽⁵⁾.

Music therapy applied to psychomotor delay may be favorable to the prevention or to a possible recovery of motor skills of the patient. People with neurological diseases, mental disabilities or global development disorders may respond in a specific way or more intensely to music. Therefore, it can have an immense therapeutic potential⁽⁶⁾.

The scarcity of data on the effectiveness of music therapy on the behavior and quality of life in children with NPMDD justifies the conduction of this study. The successful results in the quality of life that music therapy promotes are considered both in the lives of individuals with the disorder, and in the life of their relatives. Its relevance should be noted both for the academia and the scientific community, but mainly for the clinical environment. This study aims to evaluate the influence of music therapy on the quality of life of children with NPMDD, regarding physical, emotional, social and of school aspects.

METHOD

The study was preceded by the approval of the Research Ethics Committee of the Physical Therapy Program of the Northeast Brazil College (FAFIS). The informed consent form was signed by the guardians of the children included in the study, according to criteria established in resolution 196/96 of the Nacional Health Council (NHC).

It is a quasi-experimental study whose evaluation was performed with the children before and after the intervention of music therapy. The study was conducted in a specialized philanthropic association for children with this diagnosis, located in the city of Cruz das Almas - Bahia. The study period was from July to August, 2011.

Seventeen children participated in the research, aged between 5 and 12 years, of both sexes, registered in the institution, with the Neuropsychomotor Development Delay (NPMDD), and their respective parents.

For data collection we used the Pediatric Quality of Life questionnaire (PedsQL Version 4.0)⁽⁷⁾, validated in Brazil⁽⁸⁾, adapted to each age group (PedsQL 4.0 - 5 to 7 years old and PedsQL 4.0 - 8 to 12 years old). The PedsQL was designed as a modular approach to the measurement of pediatric QOL. It is applied to healthy children as well as to children with functional changes. PedsQL includes a self-evaluation for children and adolescents aged between 5 and 18 years, and questionnaires for parents of children and adolescents aged between 2 and 18 years. Although the questionnaire is not specific to children with NPMDD, it has been proved in literature to be reliable and valid. It was validated for pediatric patients with chronic health disorders and for healthy school and community populations⁽⁸⁾.

The instrument was applied to the parents in two moments, at the beginning and at the end of the survey. The researchers were trained and qualified for the standardized application of the questionnaire aiming to minimize the occurrence of biases. The questionnaire comprises questions about the behavior of the child regarding physical (eight items), emotional (five items), social (five items) and school (five items) aspects. The answers to the questions vary on five levels: 0 (it never occurred), 1 (it almost never occurred), 2 (it occurred sometimes), 3 (it often occurs) and 4 (it always occurs). The values attributed to these answers are summed up by category, and the results are compared to the moments, before and after the application of the therapeutics, in this case, the music therapy.

Items are inversely scored and linearly transposed to a scale of 0-100 (0 = 100; 1 = 75; 2 = 50; 3 = 25; 4 = 0). Elevation

of the values indicates the positive evolution in the QOL of children. Decrease in the values indicates a reduction in the parameters evaluated regarding QOL.

For the execution of the activities, the children were randomly divided in two groups. This was done to facilitate the development of the activity and the interaction between the groups. For each group, 12 music therapy sessions were held, lasting 45 minutes per session. Musical instruments (drum, flute, rattle, percussion instruments), nursery rhymes enjoyed by children and a radio with CD were used. The schematic representation of the intervention of music therapy is shown in Figure 1.

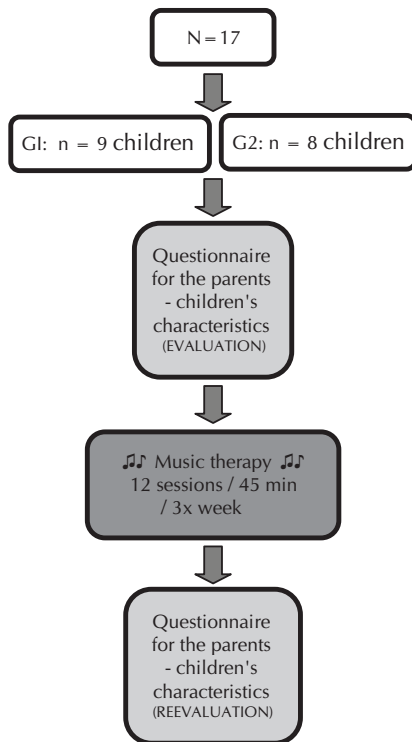


Figure 1 - Schematic representation of the intervention of music therapy

The values of the responses of the children’s parents were accounted before the music therapy sessions (evaluation) and after them (reevaluation). These data were analyzed by the SPSS software (Statistical Package for Social Sciences - 15.0 version). For categorical variables, exploratory analysis (descriptive) was performed, from the calculation of simple and crossed frequencies, both in absolute and in percentage terms. The results were organized in tables. For numeric variables, descriptive analyses (mean and standard deviations) were performed, and the paired t-test was applied, both before and after music therapy sessions with the same sampling group.

RESULTS

In this study, the ages of the children ranged from 5 to 12 years, with a mean of 8.7 years. Unintentionally, there was a

predominance of males (82.4%) due to the characteristics of the population. The quality of life analysis involved the following aspects: physical, emotional, social and school capacity.

Physical Capacity

For the Physical Capacity domain, the general evaluation obtained a value of 81.5, and the reevaluation was 80.6 (p = 0.748).

Emotional Capacity

For the Emotional Capacity domain, the general evaluation obtained a value of 50.2, and the reevaluation was 66.7 (p = 0.001). In Table 1, the values of the means, standard deviation and the p-value are represented for the emotional capacity domain. This domain has 5 variables. The answers show that variable 1 (to feel afraid or scared) had a mean of 2.3 in the evaluation, and 1.8 in the reevaluation (p = 0.58); variable 2 (to be sad or depressed) reached a mean of 2.1 in the evaluation, and 1.1 in the reevaluation (p = 0.005); variable 3 (to be angry) obtained a mean of 2.0 in the evaluation, and 1.7 in the reevaluation (p = 0.096); variable 4 (difficulty sleeping) reached a mean of 2.2 in the evaluation, and 1.4 in the reevaluation (p = 0.014); and variable 5 (to be worried) obtained a mean of 1.1 in the evaluation, and 0.8 in the reevaluation (p = 0.163).

Table 1 - Comparison between the scores of the Emotional Capacity domain through the PedsQL questionnaire, before (evaluation) and after (reevaluation) the music therapy sessions for children with Neuropsychomotor Development Delay

Emotional Capacity (problems with...)	Mean	Standard Deviation	p value
1.To feel afraid or scared			
Evaluation	2.3	±0.9	
Reevaluation	1.8	±0.3	0.58
2.To be sad or depressed			
Evaluation	2.1	±0.9	
Reevaluation	1.1	±0.7	0.005*
3.To be angry			
Evaluation	2.0	±0.8	
Reevaluation	1.7	±0.9	0.096
4.Difficulty sleeping			
Evaluation	2.2	±1.6	
Reevaluation	1.4	±1.4	0.014*
5.To be worried			
Evaluation	1.1	±1.2	
Reevaluation	0.8	±0.9	0.163
Total	17	17	

Note:
 * Paired t-test, level of significance 5%
 NPMDD = neuropsychomotor development delay;
 PedsQL = Pediatric Quality of Life questionnaire.

Social Capacity

For the Social Capacity domain, the general evaluation obtained a value of 50.0, and the reevaluation was 53,2 ($p = 0.468$).

School Capacity

For the School Capacity domain, the general evaluation was of 46.4, and the reevaluation was 54.7 ($p = 0.007$). In Table 2, the values of the means, standard deviation and the p -value are represented for the school capacity domain. This domain has 5 variables. The answers show that variable 1 (to pay attention in class) had a mean of 2.4 in the evaluation, and 1.7 in the reevaluation ($p = 0.000$); variable 2 (to forget things) reached a mean of 2.4 in the evaluation, and 1.8 in the reevaluation ($p = 0.003$); variable 3 (to follow the class activities) obtained a mean of 2.4 in the evaluation, and 1.9 in the reevaluation ($p = 0.070$); variable 4 (to skip school for not feeling well) reached a mean of 1.5 in the evaluation, and 1.2 in the reevaluation ($p = 0.055$); and variable 5 (to skip school to see a doctor or to go to the hospital) obtained a mean of 1.7 in the evaluation, and 1.7 in the reevaluation ($p = 0.718$).

Table 2 - Comparison between the scores of the School Capacity domain through the PedsQL questionnaire, applied before (evaluation) and after (reevaluation) the music therapy sessions for children with Neuropsychomotor Development Delay in July and August, 2011

School aspect (problems with...)	Mean	Standard Deviation	<i>p</i> value
1.To pay attention in class			
Evaluation	2.4	± 1.0	
Reevaluation	1.7	± 1.09	0.001*
2.To forget things			
Evaluation	2.4	± 1.0	
Reevaluation	1.8	± 0.8	0.003*
3.Acompanhar as atividades			
Evaluation	2.4	± 1.12	
Reevaluation	1.9	± 1.19	0.070
4.To skip school for not feeling well			
Evaluation	1.5	± 1.0	
Reevaluation	1.2	± 1.03	0.055
5.To skip school to see a doctor or to go to the hospital			
Evaluation	1.7	± 0.9	
Reevaluation	1.7	± 0.8	0.718
Total	17	17	

Note:

* Paired *t*-test, level of significance 5%

NPMDD = neuropsychomotor development delay;

PedsQL = Pediatric Quality of Life questionnaire.

DISCUSSION

The quality of life analysis proposed for this study involved the following aspects: physical, emotional, social and school capacity.

Physical Capacity

The numerical data of this domain show that there was not a significant improvement of QOL of children with NPMDD. This is because the majority of children present minimum motor impairment, featuring an insufficient sample to generate significant relevance in the physical aspect.

Improvement of physical capacity presents distinct results in literature. QOL in children with cerebral palsy shows worsening when these children are suffering from more compromising physical limitations imposed by the disease, hindering the performance of common activities that other children the same age perform⁽⁹⁾. It is believed that the difficulty in obtaining a significant improvement in physical ability is not limited to few music therapy sessions. In addition, it is of great importance the collaboration of other therapists of the staff, such as the doctor, nurse, physiotherapist, occupational therapist, speech therapist, in such a way that there is an effective improvement of the physical condition of these children, since the physical and muscular activities involve complex brain functions. On the other hand, there are studies which claim that music can help children with special needs to grow their mental or physical boundaries, awakening their perceptive consciousness, hearing development and motor control⁽¹⁰⁾. In addition, it is known that music favors the development of somatosensory and frontal cortical areas, promoting greater efficiency in the planning and execution of tasks⁽¹¹⁾.

Emotional Capacity

The numerical data of this domain show that there was a significant improvement of QOL of children with NPMDD. The base of music is the sound. It produces different psychic changes in the person, acting on the individual's mental and emotional state. Music seems to provoke changes in the conduct of children with special needs, making them adapt better to school life. It contributes to a better performance in learning activities and socializing with the people surrounding them⁽¹²⁾. Through sound stimuli, music may penetrate the mind and the body, whatever the level of intelligence or the condition of people with special needs. It opens communication channels that extend their possibilities of expression, for whatever their greater impairment, mental, physical or emotional, people with mental deficiency respond to musical stimulus, as much as individuals situated in the range of normality.

The significant improvement in children of this study, concerning the emotional aspect, is justified by the fact that the children were receiving music therapy sessions in group. This aided them in the integration and communication process. In a research analyzing the influence of music therapy in people with NPMDD, significant results were obtained regarding the improvement of QOL; development of the capacity of non-verbal communication, self-esteem and self-confidence; development of the capacity of observation and respect for rules; affirmation and strengthening of the personality; promotion and development of expression, among others⁽¹³⁾.

Still in the Emotional Capacity domain, there was a significant difference in the variable 2 (to be sad or depressed) ($p =$

0.005) and in the variable 4 (difficulty sleeping) ($p = 0.014$). This result is corroborated by recent studies pointing that music can reduce tension and anxiety caused by stressful situations. In addition, it can contribute to the reduction of pain and improve sleep quality. It is, therefore, a valuable method of distraction⁽⁴⁾. Music therapy in pregnant women also proves to be effective in the process of adaptation of the babies in the first few months of life, improving their sleep pattern⁽¹⁴⁾.

Social Capacity

The numerical data of this domain show that there was not a significant improvement of QOL of children with NPMDD. However, it is believed that as it is a non-verbal language, music facilitates the development of affective, cognitive and social areas, constituting a very important sociological phenomenon and becoming a socialization agent.

Despite the non-significant result, behavior change was perceived by researchers, for the children were agitated and uneasy at the beginning of the survey. In the course of the sessions, there were differences in the group, and more interest and joy could be noted during the music therapy sessions. Thus, we could perceive that music therapy is effective to change the social behavior of the child with special needs. It facilitates the process of speech, communication and vocalization, and stimulates the mental process concerning aspects such as conceptualization, symbolism and understanding⁽¹⁵⁾.

In this study, it was observed that some children were shy and did not have a spontaneous verbal communication. However, with the routine of music therapy sessions, and with the trust established by the presence of the researchers during the sessions, the children showed a higher level of interaction and communication. They began to ask for the songs they liked the most, to dance in circles and to sing. This behavior is justified in literature. Music education makes music, movement and language to be presented in a playful and dynamic way, in such a way that the child feels involved and motivated to perform the exercises proposed by the teacher. If a child, for instance, has a problem of language development and cannot speak properly, music, gesture, movement and the organized rhythm of a song facilitate the speech of small sentence fragments. This allows the integration of the child in the class context. The repetition of several creative concepts leads to a learning without fear and inhibitions. Consequently, it develops the self-esteem of the child⁽¹²⁾.

The musical experience also acts as a dynamic force of change, facilitating the emotional expression of the subject, his/her communicative development, adaptation and integration to his/her new social reality⁽¹⁵⁾. It is notorious that with the music therapy sessions there was an improvement throughout the group in the social aspect, despite the non-significant result. Children started to interact with each other, playing musical instruments and teaching one another how to play them, and were vibrating with each song played.

School Capacity

The numerical data of this domain show that there was a significant improvement of QOL of children with NPMDD.

This result reinforces and points to the need of education of children with special needs. The inclusion of children with disabilities in schools is widely discussed around the world, including in Brazil. Not only the inclusion is necessary, but also the integration of children with physical, sensory or mental disability in multidisciplinary programs of education that aim to develop their skills. Thus, music therapy becomes an effective method, minimizing the impairment degree of the disease. Hence, it contributes to the inclusion of children with disabilities in both specialized and traditional schools.

Still concerning the School Capacity domain, there was a significant difference in variable 1 (to pay attention in class) ($p = 0.000$) and variable 2 (to forget things) ($p = 0.003$). When it comes to children with NPMDD, the learning process becomes more complex as the movement and posture disorders, and complications associated with them, interfere in their independence and autonomy. Such factors may hinder the monitoring of school activities. In general, music therapy influenced the learning of the children involved in the survey. At first, most children were dispersed and uneasy, making the first sessions stressful for other children. From the second week, the children showed a significant improvement in school performance. This can be verified by the report of some educators who are satisfied with the behavior of the children in the classroom, for these children are more focused and improving their school performance in general. This result proves that music seems to provoke changes in the conduct of children with special needs, making them adapt better to school life. It contributes to their social action and improves the achievement of learning activities (12).

The study results show that, among the evaluated domains, there was a significant improvement in the quality of life in the Emotional Capacity and School Capacity domains, demonstrating the beneficial effects of music therapy.

As the limitations of the study, you can point the small number of children included. We suggest that future research use a higher sample in size and time of intervention, in order to present full results about the influence of music therapy on the quality of life of children with NPMDD.

Overall, the success of this research was satisfactory according to reports of mothers whose children participated in the survey. It is believed that music may help children with NPMDD in a differentiated manner by offering motivational resources suitable for the development of attention, memory, communication, motor skills, emotional maturity and socialization. Although the results achieved are not durable in the absence of music therapy, it is worth mentioning that during its implementation, the families of these children reported a significant improvement in their QOL, which helps, even if temporarily, to promote an improvement in this aspect.

CONCLUSION

This study confirmed the influence of music therapy on QOL in an innovative manner, through the PedsQL questionnaire applied to children with NPMDD. There was a significant improvement in the emotional and school aspects, reaffirming that music therapy provides benefits to the QOL of

children with some kind of mental delay, and acts as a facilitator to minimize their suffering. The scarcity of data on the effectiveness of music therapy on the quality of life of children with NPMDD justifies the conduction of this study.

The successful results in the quality of life promoted by music therapy are considered both in the lives of individuals with the disorder, and in the life of their relatives. Thus, its relevance should be noted both for the academic and the scientific community, but mainly for the clinical environment.

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