

A study on interventions for emotional and behavioral disorders in Chinese children with autism through family games and music

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Abstract

Intervention therapy is needed for children with autism to make them grow up healthy. This paper briefly introduced autism and related interventions, divided 30 children with autism into three groups for case study. One group was interfered by family games only, one group was interfered by music therapy only, and one group was interfered by both family games and music therapy. The results showed that both family games and music therapy were effective in reducing children's autism and had insignificant difference in efficacy; the treatment effect of the intervention combining the two measures were significantly better than that of the interventions alone.

Keywords: family game, music therapy, autism, intervention

1. Introduction

The main manifestations of autism are social impairment and behavioral abnormalities. Autism has a high incidence among children. Autistic children not only have social impairment but also have weak emotional control, which is not conducive to normal education [1]. In addition, autistic children have weak control over their behaviors and emotions, which can affect not only their learning but also the learning behaviors of the children around them. In severe cases, abnormal behaviors can harm themselves and other students. In order to improve the symptoms of autistic children and to enable them to better integrate into their daily learning and communication, it is necessary to actively intervene in the treatment of autistic children [2] rather than expecting them to recover on their own. The external physiological symptoms of autism are usually caused by negative emotions. Thus, pharmacological interventions are not very effective. Due to the negative impact of the side effects of medication, pharmacological interventions cannot be used as a long-term safety measure. In addition to the aforementioned pharmacological interventions, children can also be intervened from an emotional-behavioral perspective, which simply means building a positive and active environment for autistic children [3] and using things that are easily noticed by children (e.g., music, games, etc.) to attract their attention and avoid risky behaviors. Christopher et al. [4] studied the effect of emotional and behavior disorders on Modified Checklist for Autism in Toddlers and found that combining measures that evaluate emotional and behavior problems and autism core symptoms might enhance accuracy. Menezes et al. [5] analyzed the relationship between emotional and behavior disorders and healthy quality of life in autistic children and found that emotional and behavioral disorders should be considered when testing the quality of life of autistic children. Dominic et al. [6] studied the factors that influence the mental health stability of individuals with autism and found that factors such as the patient himself, family, and community environment could affect mental health stability. This paper briefly introduced autism and the related interventions and divided 30 autistic children into three groups for case study. One group was interfered by family games only, one group was interfered by music therapy only, and one group was interfered by both family games and music therapy.

2. Autism and related interventions

Autism is a disease resulting from a neurological disorder during physical development, whose main symptoms are social impairment, repetitive and stereotyped behavior, and single narrow interest activities. Autistic children have emotional and behavioral disorders [7], characterized by normal physiological and intellectual status but low learning ability, inability to get along with others normally, inability to cope normally with routine changes in the surrounding environment, chronic negative emotions, and a tendency to develop avoidance emotions in the face of difficulties. Due to these symptoms, autistic children are unable to receive effective education during the period when they should be educated, which is detrimental to their future development. The emotional and behavioral disorders associated with autism can make children impulsive, which can harm themselves and others [8].

In order to improve the symptoms of children with autism and help them to be able to grow up healthily, active treatment is needed. In terms of treatment for autism, since autism is a disease caused by a disorder of the central nervous system, it can be treated with drugs that regulate the nervous system [9], but on the one hand, although autism is a disease caused by a disorder of the nervous system, the negative psychological emotions that result from its development can in turn aggravate the condition, which simply means that autism is a disease under the influence of both physiology and psychology. In short, autism is a disease with both physical and psychological effects, which is difficult to be effectively treated by drugs alone, and children's bodies are still in the developmental stage, and long-term use of drugs may negatively affect growth and development [10].

In addition to the above-mentioned treatment modalities through pharmacological interventions, there are also ways to intervene in the patient's emotional behavior from a psychological perspective. Examples include using music to treat children with autism and encouraging children with autism to participate in family games together. Music therapy is a way of treating the patient physically and psychologically with the help of music in a therapeutic environment. Formal music therapy is not a random musical activity, but a systematic intervention process with the help of a musical system, which requires a professional music therapist, a therapeutic client, and therapeutic music [11].

Game therapy is likewise a form of intervention therapy for children with autism. It is similar to music therapy, but it uses games as a medium to interfere with the emotional behavior of the patient [12]. During game therapy, the therapist provides a comfortable environment for the patient and then communicates with the patient through games. In the process of play, the patient do not have to resort to language to express their thoughts, which effectively avoids the problem that children with autism are not verbal, and games can attract the patient to explore things, exercise his ability to interact with their surroundings, and strengthen their ability to cope with environmental changes.

3. Example analysis

3.1 Subjects

Thirty autistic children were taken as subjects for analysis. Table 1 shows the basic conditions of the analyzed subjects. Among the 30 children, there were 15 boys and 15 girls. The mean age of the boys was 6 ± 1.1 years, and the mean age of the girls was 6 ± 1.2 years. They were diagnosed by a professional pediatrician, and all met the criteria for autism diagnosis. Due to the special nature of these children, informed consent was signed by the children's guardians on their behalf after explanations. The experimental data were used for research purposes only.

Table 1 Basic status of the analyzed subjects

Age/years	Gender	Number/n	Degree of autism
6 ± 1.1	Male	15	Diagnosed by a professional pediatrician and meets the criteria for autism diagnosis
6 ± 1.2	Female	15	

3.2 Test methods

First, the 30 children were divided into three groups, each group consisted of five boys and five girls. One was the family game intervention group, one was the music therapy intervention group, and one was the comprehensive intervention group. The intervention experiment lasted for four weeks. The degree of autism was assessed at three time points: one week before the intervention, after two weeks of intervention, and one week after the intervention. The autism behavior checklist (ABC) scale [13] and childhood autism rating scale (CARS) were used to test the autism level of the three groups of children.

The ABC scale measures autism in five aspects: language, motor, relating, self-care ability, and sensory. Every aspect is refined. There are totally 57 test items, and every item has four points; the higher the score, the severer the degree. If the total score is above 31 points, there is a possibility of autism; if the score is above 62 points, it is judged as having autism.

The CARS [14] is usually used in conjunction with the ABC scale. There are 15 items in the scale, and every item has four options from low to high; the more abnormal the subject's behavior, the higher the score. The highest score is 4 points, and the lowest score is 1 points. The total score is 60 points. Subjects with scores above 30 but below 36 were considered having mild or moderate autism, and those with scores above 36 points were considered

having severe autism.

3.3 Modes of intervention

(1) Family game intervention

Family game interventions were conducted twice a week, on Wednesdays and Saturdays. The family game interventions included balloon fight, little naughty, and shield of anger. “Balloon fight” is a game in which the patient experienced the fun of confrontation and interaction in the family environment through the medium of balloons, and the guardian discussed the rules with the child and defined the rewards and punishments in the confrontation game.

“Little naughty” is a simulation using dolls to guide the patient to think from a third-party perspective, and the guardian used drawings to help describe the scenario.

“Shield of anger” is a game in which the guardian guided the patient to use the cardboard as a shield to understand anger and express it correctly. During the game, the guardian guided the patient to use the cardboard as a shield, drew with the patient on the outer layer of the shield what made him or her angry and the manifestation of anger. Moreover, the guardian stood along with the patient behind the shield and guided the patient to image that he or she was attacked by the anger and use the shield to resist it.

(2) Music therapy intervention

Music therapy interventions were conducted twice a week, on Wednesdays and Saturdays. During the visual music therapy, the therapist used a visual music therapy device in a darkened room to intervene with the patient. The device has functions of playing music and animation and is equipped with a light-emitting diode (LED lamp) that can emit red, blue, and green light. During the treatment, the device played music along with animation on the screen. The screen was divided into two parts, one for the animation matching the music and one for a static picture matching the animation. In addition, the therapist paid attention to the patient’s emotion in real time during the treatment and adjusted the music and the color of the LED lamp according to the emotional state.

(3) Comprehensive intervention

In the comprehensive intervention group, both family games and music therapy interventions were used to intervene in the emotional and behavior disorders of the children. The family game intervention was conducted on Mondays and Thursdays, and the music therapy intervention was conducted on Wednesdays and Saturdays. The specific content of the two interventions were consistent with the other two groups.

3.4 Mathematical statistics

SPSS software [15] was used to perform statistical analysis on the collected data.

3.5 Results

Table 2 shows the ABC scale test results for children with autism in the family game intervention group, the music therapy intervention group, and the comprehensive intervention group at three time points: one week before the intervention, after two weeks of intervention, and one week after the intervention. It was seen from the comparison of the data in Table 2 that the ABC scale scores in the three groups decreased with the progress of the intervention, and the P values at different time points were less than 0.05, indicating significant differences. This suggested that the ABC scale scores of the children in the three groups decreased significantly after the respective interventions, and the degree of autism decreased significantly.

Table 2 Differences in the ABC scale score in the three groups of children with autism before, during, and after the interventions

	One week before the intervention (T1)	After two weeks of intervention (T2)	One week after the intervention (T3)	P value between T1 and T2	P value between T1 and T3	P value between T2 and T3
Family game intervention Group (Group A)	33.9 ± 1.1	30.2 ± 1.2	24.3 ± 1.1	0.002	0.001	0.002
Music therapy intervention group (Group B)	33.7 ± 0.9	30.4 ± 0.9	24.1 ± 0.9	0.002	0.000	0.001
Integrated intervention group (Group C)	33.8 ± 0.9	28.8 ± 0.8	21.3 ± 0.8	0.001	0.001	0.000

P value between groups A and B	0.142	0.135	0.147	
P value between groups A and C	0.167	0.002	0.001	
P value between groups B and C	0.158	0.001	0.000	

It was found from the comparison of the ABC scale score between different groups at the same time point that one week before the intervention, i.e., before the intervention, the P values were all greater than 0.05, i.e., the differences were not significant, indicating that the differences in the degree of autism between the three groups were not significant; thus, the subjects could be used for the subsequent test. Two weeks later, the differences in the ABC scale scores between the family game intervention group and the music therapy intervention group were not significant, and the differences in ABC scale score of the comprehensive intervention group with the family game intervention group and the music therapy intervention group were significant. One week after the intervention, the difference between the family game intervention group and the music therapy intervention group was still not significant, and the score of the comprehensive intervention group was significantly lower than that of the other two groups.

Table 3 shows the results of the CARS scale test for children with autism in the family play intervention group, the music therapy intervention group, and the comprehensive intervention group at three time points: one week before the intervention, after two weeks of intervention, and one week after the intervention. It was observed in the data in Table 3 that there was a significant decrease in the CARS scale score in all three groups as the intervention progressed. The comparison of the CARS scale score between the three groups at the same time point demonstrated that the difference in the CARS scale score between the three groups was not significant before the intervention; after two weeks of intervention and one week after the intervention, the difference in the score between the family game intervention group and the music therapy intervention group was not significant, and the score of the comprehensive intervention group was significantly lower than that of the other two groups.

Table 3 Differences in the CARS scale score in the three groups of children with autism at three time points: before, during, and after intervention

	One week before the intervention (T1)	After two weeks of intervention (T2)	One week after the intervention (T3)	P value between T1 and T2	P value between T1 and T3	P value between T2 and T3
Family game intervention group (Group A)	31.9 ± 1.3	28.2 ± 1.2	19.3 ± 1.1	0.002	0.001	0.002
Music therapy intervention group (Group B)	31.7 ± 1.9	28.4 ± 0.7	19.1 ± 0.9	0.002	0.000	0.001
Comprehensive intervention group (Group C)	31.8 ± 1.9	24.8 ± 0.9	15.3 ± 0.8	0.001	0.001	0.000
P value between groups A and B	0.157	0.178	0.167			
P value between groups A and C	0.148	0.002	0.001			
P value between groups B and C	0.169	0.001	0.000			

4. Discussion

In this paper, 30 children with autism were selected and divided into three groups, one interfered with family games only, one with music therapy only, and one with both family games and music therapy. In the experiment, the ABC scale and CARS scale tests were performed at three time point: one week before the intervention, after two weeks of intervention, and one week after the intervention. The effects of family games and music therapy on the emotional and behavioral disorders of children with autism were analyzed based on the results of the scale tests.

The final scale test results have been shown in the previous chapter. The differences in the ABC scale and CARS scale scores between the three groups of children before the intervention were not significant, indicating that the levels of autism were consistent between the three groups and could be used for subsequent comparative analyses. After the intervention, there was a significant decrease in the ABC scale and CARS scale scores in all three groups,

suggesting that the intervention was effective in the treatment of autism. In addition, the comprehensive intervention group that used both interventions had lower ABC scale and CARS scale scores than the other two groups during the intervention, while there was no significant difference between the other two groups.

The reasons for the above results were analyzed. The family game intervention is a family-based approach to autism treatment, which uses family members who are closer to the child to minimize the child's resistance to treatment. Children are more receptive to the subtle influence of games than rigid verbal instruction. Among the games used in this study, "balloon fight" is a physical activity to reduce the child's time for random thinking, and the parent-child confrontation can strengthen the emotional connection between them and the child's competitive mentality; "little naughty" provides children with a third-party perspective to think about problems, which can strengthen their courage to face problems; "shield of anger" helps children understand the protective role of anger and vent their anger in an appropriate way. All of these games helped children with autism to have a more positive attitude towards communication and problems.

The music therapy intervention is led by a more professional music therapist compared to family games. Although children may be more resistant to music therapy than the family game intervention, it is more excellent in terms of professionalism. Visual music therapy was used, in which a visual music therapy device was used to play music and the corresponding animation and give appropriate background light. This measure used music, animation, and background lighting colors to guide the child's emotions so that he or she could maintain a stable and positive mood.

The two measures mentioned above treated children with autism from different perspectives. The family game measure reduced autism by enhancing interaction with the surrounding environment and people, and the music therapy measure reduced autism by guiding the mental emotions of children with musical empathy. The results of the scores of the family game intervention group and the music therapy intervention group demonstrated that there was no significant difference between the two measures. However, due to the different entry angles of the two measures, they were combined to intervene in the treatment of children with autism in multiple ways. The test results of the comprehensive intervention group in the previous chapter also verified that combining the two interventions had better intervention effects on emotional and behavioral disorders.

5. Conclusion

This paper briefly described autism and the related interventions and divided 30 children with autism into three groups. The three groups were interfered with family games, music therapy, and family games in combination with music therapy, respectively. The following results were obtained: (1) before the intervention, the differences in the ABC scale and CARS scale scores between the three groups were not significant; (2) the ABC scale and CARS scale scores of the family game intervention group, the music therapy intervention group, and the comprehensive intervention group decreased as the intervention progressed; (3) after the intervention, there was no significant difference in the scale scores between the family game intervention group and the music therapy intervention group, while the scale scores of the comprehensive intervention group were significantly lower than those of the other two groups.

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