THE EFFECT OF EIGHT WEEKS OF BRAITONIC TRAINING ON SKILL BEHAVIORS OF AUTISTIC CHILDREN

EL EFECTO DE OCHO SEMANAS DE ENTRENAMIENTO BRAITÓNICO EN LOS COMPORTAMIENTOS DE HABILIDAD DE LOS NIÑOS AUTISTAS

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ABSTRACT

Background: Autism is the most common disease in the spectrum of pervasive developmental disorders. The main reason for this research was to find the effect of eight weeks of braitonic training on the skill behaviors of autistic children.
Materials and Methods: The present study was quasi-experimental research in terms of applied purpose and research method, which was conducted as a pre-test and post-test. Therefore, among the statistical population of the present study, which included children with autism symptoms aged 6 to 8 years, who were referred to welfare centers in Tabriz for treatment, 30 people were selected voluntarily and randomly selected in two groups of 15 people who underwent braitonic and control. Before completing the exercises, the Garz questionnaire was completed by parents. The experimental group performed Braitonic exercises under the supervision of a braitonic instructor and a psychologist in one of the multi-purpose halls of Tabriz for two sessions of 45 minutes a week for 2 months. The control group engaged in their daily activities. After the training program (post-test), both experimental and control groups were measured and completed the Garz questionnaire by parents. For inferential analysis of data SPSS 21 software at $p \geq 0.05$ as a significant level was used. Analysis of variance in repeated measures and t-tests was taken to find data.
Results: Findings showed that eight weeks of braitonic training has a significant effect on the coordination, agility and reaction of children with autism.
Conclusion: braitonic exercises can have a significant positive effect on the motor skills of autistic children.

Keywords: braitonic; skillful behaviors; coordination; agility; reaction.

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RESUMEN

Antecedentes: El autismo es la enfermedad más común en el espectro de los trastornos generalizados del desarrollo. La razón principal de esta investigación fue encontrar el efecto de ocho semanas de entrenamiento braitónico en los comportamientos de habilidad de los niños autistas.
Materiales y Métodos: El presente estudio fue una investigación cuasi-experimental en cuanto al propósito aplicado y método de investigación, el cual se realizó en forma de pre-prueba y post-prueba. Por lo tanto, entre la población estadística del presente estudio, que incluía niños con síntomas de autismo de 6 a 8 años de edad, que fueron remitidos a centros de asistencia social en Tabriz para recibir tratamiento, se seleccionaron 30 personas de forma voluntaria y aleatoria en dos grupos de 15 personas que se sometieron a braitónico y control. Antes de completar los ejercicios, los padres completaron el cuestionario de Garz. El grupo experimental realizó ejercicios de Braitónico bajo la supervisión de un instructor de braitónico y un psicólogo en una de las salas polivalentes de Tabriz durante dos sesiones de 45 minutos a la semana durante 2 meses. El grupo de control se dedicaba a sus actividades diarias. Después del programa de entrenamiento (post-test), tanto el grupo experimental como el de control fueron medidos y los padres completaron el cuestionario de Garz. Para análisis inferencial de datos usando el software SPSS 21 a $p \geq 0.05$ como nivel significativo. Se realizó un análisis de varianza en medidas repetidas y pruebas t para encontrar datos.
Resultados: Los hallazgos mostraron que ocho semanas de entrenamiento braitónico tienen un efecto significativo en la coordinación, agilidad y reacción de los niños con autismo.
Conclusión: los ejercicios braitónicos pueden tener un efecto positivo significativo en las habilidades motoras de los niños autistas.

Palabras clave: braitónico; comportamientos hábiles; coordinación; agilidad; reacción.

INTRODUCTION

Pervasive developmental disorders are one of the most common childhood disorders that result in serious defects in adulthood. According to the DSM-IV TR, autism is the most common disease in the spectrum of pervasive developmental disorders. Autism, in general terms, means that a person can have a mild or very severe autism.[1] At the highest end of the spectrum is Sberger Syndrome, or high-functioning autism disorder, sometimes called '*little professor syndrome*'. The lowest end of the spectrum is often referred to as classical autism, which usually results in mental retardation associated with performance. So people perceive to experience motion and move to experience perception.[2]

Children with autism often have many problems in social interactions, most of which we take for granted. These children have very different experiences of the world than other people, so it is not surprising that other people's actions and reactions often turn out to be a mystery to them. When we are in social situations, we are heavily dependent on our own experiences to decide how to act and respond to others in this situation. This shared experience is the basis of our ability to feel and understand others. For children whose limbs and senses respond very differently, it is not surprising that they often react inappropriately. These children are often unaware of the subtle differences in facial expressions or hand and foot reactions when speaking. Gestures that make us aware of their reactions to others, raising an eyebrow cause us to change the title and subject of the conversation or a dry state is a sign for us to slowly move away from someone. The reactions of people with autism often seem uncontrollable or rude.[3, 4]

Regarding the social interactions of autistic patients, they seldom approach others and may look at others as if they do not see them or may look around them. These children do not make eye contact with others, and if they do make eye contact, it is dazzling and unusual. These children do not seem to distinguish one person from another and do not participate in other people's games, and sometimes the game is not attractive and lovable for them at all.[4]

One of the symptoms of this disease in children is the presence of stereotyped, stereotyped and repetitive behaviors so that the slightest change in the environment may cause them annoyance. These children also have problems with echoes and pronouns. Sometimes these children become so attached to an object that they carry it with them all the time and may become very upset and disturbed by changes in their daily routine, or they may arrange toys frequently and obsessively in their toys. Other behavioral symptoms such as constant body movement, body shaking, walking on the toes, holding the toes, or staring at rotating objects such as a fan for a long time are other behavioral symptoms of an autistic child.[5]

The cause of the disease is not yet known, but there are strong genetic symptoms for the disease, and some believe the disorder is more common in boys than girls.[7] With the advancement of science and the development of research on autism, the salient features of these patients have been identified and the criteria for its diagnosis have become easier, so that unlike in the past when the disease was confused with other problems such as cerebral palsy and mental retardation, today psychologists and specialists They can differentiate this disease from other mental and cerebral problems and disorders and offer ways to treat it. In recent years, favorable results have been obtained for the treatment of this disease, which includes pharmacological and non-pharmacological therapies, and these two types of treatments should be done together. In non-drug therapies, we can mention the use of learning methods, behavior therapy, family education, communication and social skills training, and the use of reward and punishment techniques.[8]

Research Findings on the Relationship between Autism Disorder and Participation in Children's Physical Activities, Creating opportunities for Social Interactions in Sport and Physical Activity,[9] Reducing repetitive stereotyped movements.[10]

One of the physical activities that have been invented by Iranian trainers is braitonic exercises.[11] Braitonic exercises are a form of games and physical activity. Braitonic is a sport that is coded based on letters. The alphabet of different languages inspired by line for international and execution of coded visual, numerical, motor and sports movements and letters of different languages is based on a six-cell table. It is enough to do it. Imagine six points in space with our feet and perform sports exercises by performing movements on them.[12] Each of the braitonic skills can be done by anyone regardless of their physical, mental and social condition. Braitonic exercises can be done by everyone at the same time. Braitonic exercises have many advantages that distinguish it from other types of exercises. This type of exercise can be performed in groups or individually for any gender, any age and in any physical condition. Braitonic exercises can be the most attractive in the form of games, sports and entertainment for children, which makes children participate in these exercises with enthusiasm and desire. It seems that this type of exercise in the form of games can be effective in developing skills and stereotypes.[13]

The positive effect of aerobic activities on stereotyped behaviors of autistic children has been reported by Pourkhorshidi and Eskandenjad.,[14] Tavanapour and Rahbanfard,[10] the effect of braitonic exercises on perceptual-motor abilities of female elementary school students, Karimi and Ayatizadeh,[16] the effect of braitonic on stable attention and static balance in hyperactive children, Danghian et al.[17] in the effect of braitonic on motor development of primary school children, Bagheri et al.,[6] in the the effect of a course of braitonic exercises on concentration and academic achievement of Iranian and Afghan students and Dehghanizadeh et al.[18] in the effect of a braitonic exercises on growth motor skills of children with trainable IQ believe that braitonic exercises have a positive effect on motor skills. However, research showing the effect of this activity on improving some of the skills and stereotyped behaviors of girls with autism has not been observed in the literature. Due to the fact that this sport originated in Iran and is in its early stages, the researcher also decided that the effect of this sport activity on improving some of the skills and stereotyped behaviors of 6 to 8 year old girls with autism in Tabriz study so that perhaps the results of this research can pave the way for improving some of the skills of these children and their stereotyped behaviors in order to target some of the research weaknesses of the basic information needed to design first-line therapeutic interventions to medical institutions, officials Education and families with a therapeutic approach should be provided to clinical sports psychologists.

RESEARCH METHOD

The present study was a quasi-experimental research in terms of applied purpose and research method, which was conducted as a pre-test and post-test.

Statistical Society

According to the purpose, the statistical population of the present study included 43 children with autism symptoms aged 6 to 8 years who were referred to welfare centers in Tabriz for treatment.

Sample

Participants included children with autism aged 6 to 8 years, 45 people who were referred to welfare centers in Tabriz for treatment. Using voluntary sampling of parents who were willing to participate in this study, the necessary number was selected and a briefing session was held. Parents who wished their children to participate in the desired treatment program were registered. The criteria for entering this research include the following; no use of special drugs, no neurosurgery, no fractures in the limbs, complete physical health. Then the children were randomly divided into two groups of 15 people: Braitonic and Control. Braitonic exercises were held in one of the multi-purpose halls of Tabriz. Before the exercises, Garz Autism Questionnaire[20] was given to parents and completed. The training program was held on even days in the morning from 10:00 to 11:00 by an instructor and a psychiatrist. Training sessions were held every week for 45 minutes for 2 months. After the training sessions, a practical test was performed according to the standards of the provincial sports board and the scores were recorded on special sheets. After completing the exercises, the Garz questionnaire was completed by parents.

Research measurement tools

A) Garz test: Garz test is a checklist that helps diagnose autistic people. The test was standardized in 1994 and identified issues of autism in a sample of 1,094 people from 46 states in Colombia, Puerto Rico and Canada. The Garz test is based on the definitions of the American Autism Society (ASA, 1994) and the American Psychiatric Association (APA) and relies on the DSM-IV.[20]

The Garz test is suitable for people 3 to 22 years old and can be completed by parents and professionals at school or at home. Garz includes four subscales and each subscale contains 14 items (items). The first subscale is stereotyped behaviors, which include 1 to 14 items. This subtest describes cases of stereotyped behaviors, movement disorders, and bizarre behaviors. The second subscale, which is communication, includes items 15 to 28. These items describe verbal and nonverbal behaviors that are signs of autism. Social interaction is the third subscale, which includes items 29 to 42. The items in this subscale evaluate topics that are able to properly describe events to people. The fourth subtest is developmental disorders, which include items 43 to 56. This subscale asks key questions about a person's childhood development.

Garz reliability is accepted in the acceptable range. Studies have shown an alpha coefficient of 0.90 for stereotyped behaviors, 0.89 for communication, 0.93 for social interaction, 0.88 for developmental disorders, and 0.96 in autism semiotics. Garz is the only test that has not only reported the reliability of the test-retest method, but more importantly, the reliability between the scorers. The validity of the test has also been confirmed by comparison with other autism diagnostic tools.

B) Motor skills

Reaction test

This test was used to determine motor function (reaction). Hold the ruler at the zero point from the end and ask the person being trained to place the thumb and forefinger of one of their hands at the 50 (50 cm) point of the ruler. While staring at the ruler, it should be left unannounced. By taking the ruler, the number of the contact point of the fingers is recorded.[21]

Coordination test by throwing the ball towards the wall by hand

This test is used to determine motor function (coordination). This test will be used to measure eye-hand coordination. This test requires a tennis or baseball, a bar meter and a stopwatch. To perform the test, a certain distance of two meters from the wall is specified, the person standing behind the error and in front of the wall. Throw the ball to the wall with one hand (throwing under the rampart) and in return try to catch it with the other hand. The ball is thrown back into the wall with the receiver's hand and must be received with the first hand that made the first throw. This test can be continued as a period of time (30 seconds) or as the number of throws.[21]

Agility test with 9 × 4 meters

This test is used to determine motor performance (agility). The subject is placed behind the starting line with a standing starter. It takes position with the sign in its place and starts moving with the sign. After a distance of 9 meters, he picks up the first piece of wood and then returns to the starting point and places the wood behind the line. Immediately return and remove the second piece of wood from the starting line to cross quickly (no need to put the second piece of wood on the ground). The best test record was recorded after twice times.[21]

Data collection method

After sampling and selecting the target individuals according to the criteria, data collection was done in several stages. Written consent was obtained from parents who wished to participate in the research to participate in the research program planning sessions. In order to conduct this research, a clinical psychiatrist conducted a clinical interview among the patients referred to several counseling centers in Tabriz whose children had symptoms of autism and also in the age group of 6 to 8 years, and then they will try to obtain their consent to cooperate.

Assessment and evaluation of the group program was done in two stages: the first stage after receiving the registration package and just before the start of training sessions; And the second stage right after the last training session. In the first stage, before starting the special intervention program, the sample (pre-test), demographic characteristics of the family, and the subjects were evaluated through a Garz questionnaire completed by the children's parents. The children were then randomly assigned to experimental (n = 15) and passive control (n = 15) groups. Then, for 2 months, both groups under the supervision of an expert trainer engaged in Braitonic sports activities. During these 2 months, they were under the supervision of a researcher and a psychiatrist. Each group performed two sessions per week under the supervision of the researcher for 30 minutes and had a joint group session with the researcher each week to ensure the progress of the program.

Finally, in the second stage, after the implementation of the training program (post-test), both experimental and control groups were measured and measured by the parents by completing the Garz questionnaire. In order to comply with ethical issues, the researcher after the end of the research will be able to receive other treatments if the participants wish.

Statistical analysis methods

In data analysis, in addition to calculating descriptive indices (including calculating frequency distribution tables, percentages, calculating central tendency and dispersion indices such as mean and variance, etc.), inferential indices were calculated. For inferential analysis of data using SPSS 21 software at an alpha level of less than 0.05 as a significant level in accordance with the research hypotheses, analysis of covariance in repeated measures was taken.

RESULTS

Table 1. Results of analysis of covariance to investigate the differences in coordination in the post-test between the experimental and control groups

SOURCE OF CHANGE	SS	DF	AVERAGE SQUARES	F	SIG.	ETA SQUARES
The effect of pre-test	153.80	1	153.80	1645.14	0.001	0.984
Group effect	6.95	1	6.95	74.41	0.001	0.734
Error	2.52	27	0.093			
Total	1838.42	30				

According to the table, it can be seen that the group effect is significant at the level of 99% probability (p=0.001, Eta squared=0.73, F=74.41). That is, after adjusting the pre-test scores, the degree of coordination in the post-test in the control group and the experimental group has a significant difference.

Table 2. Modified average of coordination

GROUP	N	ADJUSTED MEAN	STANDARD ERRORS
Experimental	15	7.94	0.079
Control	15	6.97	0.079

On the other hand, the adjusted means indicate that the level of coordination in the experimental group (m=7.94) is significantly higher than the control group (m = 6.98). Therefore, it is concluded that eight weeks of Braitonic training has a significant positive effect on increasing coordination in children with autism.

Table 3. Results of analysis of covariance to evaluate the difference in agility in the post-test between the experimental and control groups

SOURCE OF CHANGE	SS	DF	AVERAGE SQUARES	F	SIG.	ETA SQUARES
The effect of pre-test	13522398.16	1	13522398.16	7571.02	0.001	0.996
Group effect	347819.89	1	347819.89	194.74	0.001	0.782
Error		27	1786.07			
Total		30				

According to the table, it can be seen that the effect of the group is significant at the level of 99% probability (p= 0.001, Eta squared=0.78, F=194.74). That is, after adjusting the pre-test scores, the degree of agility in the post-test in the control group and the experimental group has a significant difference.

Table 4. Modified mean agility

GROUP	N	ADJUSTED MEAN	STANDARD ERRORS
Experimental	15	2777.71	10.91
Control	15	2562.35	10.91

On the other hand, the adjusted means indicate that the level of agility in the experimental group (m = 2777.72) is significantly higher than the control group (m = 2562.35). Therefore, it is concluded that eight weeks of braitonic training has a significant positive effect on increasing agility in autistic children.

Table 5. Results of analysis of covariance to investigate the difference in reaction in the post-test between the experimental and control groups

SOURCE OF CHANGE	SS	DF	AVERAGE SQUARES	F	SIG.	ETA SQUARES
The effect of pre-test	1326.07	1	1326.07	290.47	0.001	0.9150
Group effect	113.36	1	113.36	24.83	0.001	0.479
Error	123.26	27	4.56			
Total	40435	30				

According to the table, it can be seen that the effect of the group is significant at the level of 99% probability (p = 0.001, Eta squared = 48, F = 24.83). That is, after adjusting the pre-test scores, the reaction rate in the post-test in the control group and the experimental group has a significant difference.

Table 6. Adjusted average reaction

GROUP	N	ADJUSTED MEAN	STANDARD ERRORS
Experimental	15	37.91	0.55
Control	15	34.01	0.55

On the other hand, the adjusted means indicate that the reaction rate in the experimental group (m = 37.92) is significantly higher than the control group (m = 34.02). Therefore, it is concluded that eight weeks of braitonic training has a significant positive effect on increasing the reaction of autistic children.

Table 7. Results of analysis of covariance to examine the differences in social interaction in the post-test between the experimental and control groups

SOURCE OF CHANGE	SS	DF	AVERAGE SQUARES	F	SIG.	ETA SQUARES
The effect of pre-test	2291.36	1	2291.36	1640.94	0.001	0.984
Group effect	115.65	1	115.65	82.82	0.001	0.754
Error	37.70	27	1.39			
Total	47819	30				

According to the table, it can be seen that the effect of the group is significant at the level of 99% probability (p= 0.001, Eta squared=75, F=82.83). That is, after adjusting the pre-test scores, the amount of social interaction in the post-test in the control group and the experimental group has a significant difference.

Table 8. Adjusted average of social interaction

GROUP	N	ADJUSTED MEAN	STANDARD ERRORS
Experimental	15	40.86	0.305
Control	15	36.93	0.305

On the other hand, the adjusted means indicate that the rate of social interaction in the experimental group (m=40.86) is significantly higher than the control group (m = 36.94). Therefore, it is concluded that eight weeks of braitonic training has a significant positive effect on increasing social interaction in children with autism.

DISCUSSION

The results showed that eight weeks of braitonic exercises had a significant effect on the coordination of children with autism. Subsequent findings of the study showed that aerobic training has a significant effect on the coordination of autistic children. The explanation for this finding is that physical exercise distributes strength and timing between movements and better learning, resulting in the creation and refinement of related movement programs. The increase in coordination can also be attributed to the reliance on deep receptor motion sensing information. Therefore, it can be concluded that rhythmic exercises facilitate the transmission of messages from the somatosensory nerves to higher neural centers and lead to increased coordination.[22] Rhythmic movements create conditions for children to develop their talent for entering the next stages of education in other words this type of movement paves the way for the development of the next motor skills.[4] Autopsy studies revealed the absence of Purkinje and granule cells as well as incomplete growth of the hemisphere and vermis in the posterior region. On the other hand, the prominent role of the cerebellum in controlling movement, including balance and coordination, is well defined. The cerebellum acts as a two-way passage between the visual, auditory and sensory-physical cortex.[23]

The results showed that eight weeks of braitonic exercises had a significant effect on the agility of autistic children. These findings are consistent with the research results of Dana et al.[15,] Pourkhorshidi and Eskandenjad,[14] Sabzi et al.,[5] Berkeley et al.[7] To explain this, it can be said that exercise and physical activity are very effective for effective and efficient performance of people in the areas of motor skills, including agility. The greater the individual's movement, the greater the chance of perceptual-motor counterpart and the development of a rapid and agile response to different motor positions. Physical activity is the main factor in the development of most motor skills in which people achieve balance with a fact and control skills and knowledge of the environment. Physical activity, by stimulating the sensory-motor cortex, establishes many connections between the limbic region and the visual, speech, and auditory sectors. Nervous and thus improves motor skills.[1]

The results showed that eight weeks of braitonic training had a significant effect on the reaction of autistic children. This finding is consistent with the results of Pourkhorshidi and Eskandnejad,[14] Berkeley et al.,[7] Sabzi et al.[5] In explaining this issue, it can be said that the reaction time consists of two parts, the pre-motion time and the motion time, which are independent of each other. At the time of propulsion, perceptual and cognitive processing of the received stimulus is performed and at the time of motion, the motor output of the response begins. Research shows that changes in reaction time

increase the complexity of the response. Research on motor skills has shown that movement time is more affected by practice and learning than pre-movement time, and that the reduction in reaction time may be due more to reduced movement time than to cognitive processing speed. Magill and Anderson[24] also believe that sports activities increase a person's ability to process information. This growth in abilities is due to the fact that the individual adapts to unstable environmental situations and stimuli, and as a result, acquires the ability to solve problems and make decisions faster and more correctly. Research has shown that physical activity increases the circulation of the central nervous system and makes information processing more efficient and faster, which is an important factor in reducing reaction time. On the other hand, physical activity causes more and faster blood circulation in the limbs and raises the ambient temperature, causing the muscles to contract faster and more powerfully, and the upper limbs to react faster.

Briaitonic exercises are a phenomenon that leads to more collaboration and teamwork. The braitonic performance is in all cases inspired by a six-cell table related to the Braille line.[11] Braitonic performance with rhythmic movements in a six-cell table combines the components of art, beauty and movement and brings pleasure and relaxation to the child, which may provide a suitable platform for social interaction and finally would be the social development of the child. In order to perform rhythmic and coordinated movements, they must coordinate with each other and establish verbal and non-verbal communication so that they can perform a specific movement with the rest of the group at a specific moment. In tonic sports, skills such as cooperation, responsibility, empathy, self-control and self-reliance are strengthened, which are components of social development. Learning for students is fun and exciting when done in the light of thinking, feeling, playing, innovating, innovative activity and creative movements.[6]

CONCLUSION

Braitonic exercises can have a significant positive effect on motor skills of autestic children.

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