



THE EFFECTS OF THE TOMATIS METHOD ON ATTENTION OF A CHILD WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A CASE STUDY

EFEKTI TOMATIS METODE NA PAŽNJU DJETETA S POREMEĆAJEM PAŽNJE I HIPERAKTIVNOSTI: STUDIJA SLUČAJA

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Case Study

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ABSTRACT

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder that affects the entire personality and is most often diagnosed during school age. The Tomatis Method involves neurosensory brain stimulation through unique listening programs. The aim of this study was to examine the impact of the Tomatis Method on the attention of a child with ADHD. The listening program was tailored to the child's specific needs and was administered by a certified Tomatis practitioner. Each treatment cycle lasted 14 days. The assessment was conducted at four time points: before and after the first cycle, and before and after the second cycle of the Tomatis treatment. A software-based assessment tool specifically designed to evaluate components of executive functions was used to measure attention. The collected data were processed using IBM SPSS Statistics 21 software for statistical analysis. Basic statistical parameters were calculated. The results showed improvements in attention-related abilities, including increased response accuracy and faster reaction times.

Key words: Tomatis Method, ADHD, attention.

SAŽETAK

Poremećaj pažnje/hiperaktivnosti (ADHD) je čest neurorazvojni poremećaj koji utiče na cjelokupnu ličnost i najčešće se dijagnosticira tokom školskog uzrasta. Tomatis metoda uključuje neurosenzornu stimulaciju mozga kroz jedinstvene programe slušanja. Cilj ovog istraživanja bio je ispitati uticaj Tomatis metode na pažnju djeteta s ADHD-om. Program slušanja je odabran na osnovu specifičnih potreba djeteta i provodio ga je certificirani Tomatis praktičar. Tokom procjene, dijete je bilo uključeno u dva ciklusa Tomatis tretmana, od kojih je svaki trajao po 14 dana. Procjena je realizirana u četiri vremenske tačke: prije početka i nakon završetka prvog ciklusa, te prije početka i nakon završetka drugog ciklusa Tomatis tretmana. Za procjenu pažnje korišten je softverski alat dizajniran za testiranje komponenti izvršnih funkcija. Prikupljeni podaci obrađeni su pomoću softvera IBM SPSS Statistics 21 za

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statističku analizu. Izračunati su osnovni statistički parametri. Rezultati su pokazali poboljšanja u sposobnostima pažnje, uključujući veću tačnost odgovora i brže reakcije.

Ključne riječi: Tomatis metoda, ADHD, pažnja.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder defined by persistent inattention (e.g., difficulty focusing, organizing) and/or hyperactivity-impulsivity (e.g., excessive movement, interrupting) that disrupts daily functioning. Symptoms must occur in multiple settings, start before age 12, and last at least six months. Patients must have experienced a minimum of six symptoms of inattention (e.g. failing to sustain attention in tasks or play activities, not listening when being spoken to directly), or six symptoms of hyperactivity/impulsivity (e.g. talking excessively, fidgeting with hands or feet) (American Psychiatric Association, 2013). Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neurodevelopmental disorders between 5–7% among children and adolescents and between 3–5% among the adult population (Roberts, Milich, & Barkley, 2015). ADHD is increasingly recognized as a developmental impairment of executive functions. Many individuals with ADHD have never had significant behavioral problems. Their difficulties are primarily in focusing attention on the required task, as well as effectively using working memory (Brown, 2013).

Neuropsychological studies have shown that ADHD patients have consistent deficits in executive functions, defined as functions that are necessary for mature adult goal-directed behaviour, such as set-shifting and set maintenance, attention control (sustained and selective attention), interference and motor inhibition, planning, decision making, temporal foresight and working memory (Stuss & Alexander, 2000; Noreika, Falter, & Rubia, 2013).

Treatment of ADHD may consist of drug therapy, behavioral therapy, or their combination (Sharma & Couture, 2014). A review of the literature indicates that some studies suggest drug therapy is more effective than behavioral therapy. However, in other studies, behavioral therapy has been shown to be equally efficacious as stimulants administered at low doses (Pelham et al., 2005).

The Tomatis Method is a natural approach to neuro-sensory stimulation of the auditory system. To listen to music using the Tomatis Method, a special set of TalksUp headphones is used, which includes headphones and a program player. The headphones allow us to listen to music through the auditory organ (via air) and the bones of the skull (perception of sound through vibrations), as they are positioned at the top of the head with a special part. The listening programs are designed to change the music in real-time (Tomatis, 2005). There are described three integration levels in his neurophysiologic model of the ear-brain connection: the vestibular, visual and cochlear integrators. He pointed out that the second (optic) cranial nerve, the third (oculomotor), the fourth (trochlear), the sixth (abducens) and the eleventh (accessory) connect with the eighth (vestibular cochlear) nerve, participating in reception and integration of information from the ear and other sensory systems (Tomatis, 1974). The Tomatis Method is applied to children with learning disorders, autism, attention disorders, developmental and speech delays, brain injuries, and sensory system dysfunctions (Thompson

& Andrews, 2000). Auditory stimulation or sound therapy techniques can be used to regulate the emotional, behavioral, and cognitive problems of ADHD, particularly in terms of sustained attention, response timing, impulsivity/hyperactivity, and emotional control, by improving auditory processing (Dursun, Fidan, & Karayagiz, 2021). The aim of this study was to determine the impact of the Tomatis Method on the attention of a child with ADHD.

MATERIAL AND METHODS

Sample of participant

Our participant is a 7-year-old boy who, at the time of the assessment, was not yet attending school. He was referred to the speech therapy center "Moj logoped" in Tuzla due to difficulties with concentration, inattentiveness, easy distractibility, emotional outbursts, low frustration tolerance, and impulsivity. During the clinical interview, no significant issues were noted in his prenatal, perinatal, medical, early developmental, or family history. He appeared highly distracted and preoccupied during the interview, requiring multiple repetitions and giving late or irrelevant responses. He also showed signs of impulsivity/hyperactivity, having trouble waiting his turn. His parents decided to proceed with the Tomatis Method treatment due to concerns about his ability to adapt to the demands and responsibilities of school, as he was soon expected to begin formal education.

Method of conducting research

The study included pre- and post-assessments conducted at the beginning and end of each of the two treatment cycles of the Tomatis Method. The listening program was selected based on the child's specific needs and was administered by a certified Tomatis practitioner. Each treatment cycle lasted 14 days, for a total intervention period of 28 days.

Measuring instruments

The child's attention was evaluated using the Psychology Experiment Building Language (PEBL) software (Mueller & Piper, 2014), a program designed for neuropsychological assessments. Three tasks from this program were used to assess attention: the Bivalent Shape Task (BST), Hick's Law Test (hicks), and Move to Target.

Data processing methods

The collected data were processed using IBM SPSS Statistics 21 software for statistical analysis. Basic statistical parameters were calculated.

RESULTS

Table 1 presents a statistical summary of the child's performance on three different attention tasks before and after the Tomatis Method intervention. The variables measured include the number of trials (N), the minimum and maximum recorded values, the mean, standard deviation, and the frequency of correct responses at both the initial and final assessments.

Initially, the response times on the Bivalent Shape Task (BST) ranged from 434 ms to 9097 ms, with a mean of 3129.1 ms and a standard deviation of 1133.43 ms. The frequency of correct responses at the first assessment was 21. After the intervention, response times significantly improved, ranging from 653 ms to 4406 ms, with a reduced mean response time of 1187.75 ms and a lower standard deviation of 572.78 ms. The frequency of correct responses increased to 90, indicating a notable improvement in accuracy. Before the intervention, response times on the Hick's Law Task ranged from 2 ms to 38,653 ms, with a mean of 2174.32 ms and a standard deviation of 3825.45 ms. The frequency of correct responses was 197. Post-intervention, response times ranged from 1 ms to 10,872 ms, with a reduced mean response time of 1331.95 ms and a standard deviation of 1390.79 ms. The frequency of correct responses significantly increased to 258. Before the intervention, response time on the Move to Target Task ranged from 520 ms to 2024 ms, with a mean of 1860.65 ms and a standard deviation of 307.29 ms. The frequency of correct responses was 94. Post-intervention, response times ranged from 120 ms to 2026 ms, with an improved mean of 1548.14 ms and a standard deviation of 395.59 ms. The frequency of correct responses increased substantially to 249.

Table 1. Descriptive Statistics of Attention Task Performance Before and After Tomatis Intervention

Variable	N	MIN	MAX	AM	SD	Frequency First Assessment	Frequency Final Assessment
Bivalent Shape Task (First assessment)	96	434	9097	3129.1	1133.431	21	-
Bivalent Shape Task (Final assessment)	96	653	4406	1187.75	572.784	-	90
Hick's Law Task (First assessment)	300	2	38653	2174.32	3825.452	197	-
Hick's Law Task (Final assessment)	300	1	10872	1331.95	1390.788	-	258
Move to Target Task (First assessment)	330	520	2024	1860.65	307.289	94	-
Move to Target Task (Final assessment)	330	120	2026	1548.14	395.594	-	249

This study presents a case report of a child with ADHD who underwent two cycles of Tomatis-based intervention over a period of 28 days. The results indicated improvements in attention, including increased response accuracy and faster reaction times, following the intervention. These findings suggest that the Tomatis Method may contribute to enhancing attentional performance in children with ADHD.

Our findings are consistent with previous research on the Tomatis Method and its effects on cognitive and behavioral outcomes. Sacarin (2013) investigated the impact of Tomatis-based auditory intervention on attention, processing speed, phonological awareness, and reading efficiency in children aged eight to thirteen with ADD. The study reported significant improvements in these areas, supporting the potential benefits of the Tomatis Method in enhancing cognitive and behavioral functions in children with attention difficulties.

Similarly, the Polish project "Attention! The Way to Success" (2010–2013) explored the effects of auditory therapy on academic achievement in 1,100 students across 62 schools, including those with special educational needs. The use of the Tomatis Method in first and third grades led to significant academic improvements, while students who did not receive therapy showed no substantial progress. These findings highlight the potential role of auditory interventions in educational settings (Ratynska, 2014).

Further supporting the relevance of auditory-based interventions, a recent study in Turkey explored the effects of the audio-psycho-phonological (APP) method on ADHD symptom management in adolescents (ages 14, 15, and 17). Although the differences in scores were not statistically significant, the findings suggest that further research is needed to better understand the role of non-pharmacological interventions in the treatment of ADHD (Dursun et al., 2021).

Additionally, Esteki and Soltani (2015) examined the impact of sound therapy on attention in children with ADHD. Their sample consisted of 12 boys and girls who underwent 25 therapy sessions, each lasting 60 minutes, three times per week. The results showed that sound therapy led to improvements in attention and reductions in hyperactivity symptoms, supporting its use as an effective rehabilitation method. These findings align with the results of our study, where similar improvements in attention were observed following the Tomatis Method intervention. Both studies highlight the potential of auditory-based therapies in enhancing attentional abilities and reducing hyperactivity in children with ADHD.

CONCLUSION

The ear is one of the most complex sensory organs in the human body, with over 80% of the stimulation our brain receives coming from it. The auditory system plays a crucial role in brain plasticity, which is essential for child development. Many experts view the Tomatis Method as a useful tool that enhances executive functions, academic achievement, and significantly supports traditional therapeutic work. A review of the literature reveals several studies examining the effects of Tomatis Method treatment on children with specific learning difficulties, particularly dyslexia, communication disorders, and autism. However, research on the effects of the Tomatis Method on children with ADHD remains limited, highlighting the need for more targeted studies in this area. The results of this study suggest that the Tomatis Method positively influences attention development in children with ADHD. The case report

presented in this research shows improvements in response accuracy and reaction speed, suggesting that the method may contribute to enhancing attention in children with attention deficit hyperactivity disorder. Although prior studies have demonstrated similar positive outcomes—such as improvements in attention, processing speed, and academic achievement—further research with larger sample sizes is necessary to confirm the effectiveness of the Tomatis Method as a non-pharmacological approach to ADHD treatment. This study represents the first case report on the application of the Tomatis Method in Bosnia and Herzegovina, underscoring the importance of further research in this context. Based on the results obtained in this study, it can be concluded that the Tomatis Method has the potential to be a valuable tool in ADHD therapy. However, additional research is required to assess its long-term efficacy and applicability across various settings.

In conclusion, these findings emphasize the need for further evidence-based research with larger and more diverse samples to establish the efficacy of the Tomatis Method as a non-pharmacological intervention for ADHD.

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