

Research Paper

Study on Effectiveness of Dexterity Apparatus as a Therapeutic Tool in ADHD (Instrumentum Psychotherapy)

Dr. Linjo. C. J.^{1*}

ABSTRACT

Instrumentum psychotherapy is a new approach of utilizing psychological apparatus for treatment options rather than assessment purposes alone. Dexterity is the ability to perform a difficult action quickly and skilfully with hands. It needs accurate hand-eye coordination. To perform full dexterity apparatus, it needs continuous attention or concentration. Research shows that ADHD (Attention Deficit Hyperactive Disorder) children have poor visuo-motor coordination. The ADHD rate is increasing day by day in post-COVID scenarios so need of applying new methods of treatment is becoming more important. The research was conducted in 55 sample with dexterity apparatus along with token economy was utilized. The pretest-post test scores on the parent rating scale for ADHD was used for rating the ADHD of the sample. the t-value shows significance at 0.05 level ($p \leq 0.05$). result shows that, training children with dexterity apparatus for almost three month can result significant improvement in ADHD features. This shows the importance of finger dexterity and tweezer dexterity apparatus in the training and prognosis of ADHD.

Keywords: *Instrumentum Psychotherapy, Attention deficit hyperactive disorder (ADHD), Finger Dexterity, Tweezer Dexterity*

Instrumentum is a Latin word meaning ‘an instrument, tool, or utensil’. Instrumentum Psychotherapy is a psychotherapeutic approach where one or more psychological instruments are used along with verbal psychotherapeutic methods to bring about positive behavioural change.

This innovative approach combines established psychological concepts, such as neuroplasticity, learning, motivation, divergent thinking, attention narrowing, distraction techniques, etc. with verbal treatment methods with the help of psychological instruments designed to address behavioral disorders. Unlike traditional therapies, Instrumentum Psychotherapy leverages the potential of psychological instruments that are typically used for assessment purpose in psychology. By harnessing these instruments to facilitate therapeutic interventions, behavioral changes can be effectively induced, leading to greater treatment efficacy and long lasting results.

¹Clinical Psychologist, Louise Mount Hospital, Kerala, India

*Corresponding Author

Received: August 7, 2024; Revision Received: September 15, 2024; Accepted: September 19, 2024

Study on Effectiveness of Dexterity Apparatus as a Therapeutic Tool in ADHD (Instrumentum Psychotherapy)

Dexterity is the ability to perform a difficult action quickly and skillfully with the hands. The ability to think quickly and effectively or to do something difficult extremely well, with greater visuomotor coordination shows sharper dexterity. The findings show that the higher the dexterity, the larger the brain. Animal, as well as human studies, show that greater dexterity of hands is performed by those with larger brain size. Dexterity is made possible by seamless integration of our hands into our cognitive system, making our manual skills an important part of our interaction with the environment and of our capacities for feeling, explaining, acting, planning, and learning.

Manipulating small objects and exploring their shape and texture requires highly skilled hand and finger movements. A substantial amount of anatomical, electrophysiological, and clinical evidence suggests that the principal constituent of the motor system underlying the performance of highly skilled finger movement is the corticospinal pathway and more specifically its corticomotoneuronal components. Earlier studies suggested that the primary motor cortex is necessary and largely sufficient to control skilled movements. Another part which has a major contribution to dexterity is the cerebellum. The cerebellum is located behind the brainstem. While the frontal lobe controls movements, the cerebellum “fine tunes” this movement. This area of the brain is responsible for fine motor movements, balance and the brain’s ability to determine limbs. Pathological, morphological and functional imaging studies have shown the cerebellum to be one of the cerebral structures affected in some of the cognitive and behavioral developmental disorders like ADHD, Autism, and Schizophrenia.

Finger Dexterity

The finger dexterity battery developed by O’Connor in 1926, is a standardized assessment of hand-eye coordination as well as fine motor control and consists of activity involving finger test. Placing each pin into a single hole on the board, by using only his/ her fingers. The O’Connor finger dexterity test has been used successfully as a predictor wherever rapid manipulation of objects, especially the picking up and placing of small parts, is important. It has been found useful in predicting success in instrument work which requires the assembling of armatures, miniature parts, assembling of clocks and watches, rapid hand work in the filling vials, small lathe work and machine winding.

The O’Connor finger dexterity equipment with 310 pins, 1 inch in length and 0.72 mm in diameter in a tray of about 5*6 inches generally slopping sides, and a metal plate with 100 holes. The holes are arranged in ten rows and spaced half inch apart.

Tweezer Dexterity

Tweezer Dexterity developed by O’Connor (1926) is a test to assess visuomotor coordination. It measure the speed of an individual to pick up the pin, one at a time and place them in the holes of board on a metal or wooden plate. This test may be applicable to people who are successfully engaged in doing very minute work requiring delicate assembling such as in watchmaking, making precision instruments, and microscopic laboratory works.

The board contains 100 holes, including one tweezer and 100 pins. The tweezer is done by placing a single pin in each 1/16-inch diameter hole.

Study on Effectiveness of Dexterity Apparatus as a Therapeutic Tool in ADHD (Instrumentum Psychotherapy)

Relationship between ADHD and visuomotor-coordination

Research shows that ADHD children have poor visuomotor coordination. Neuroanatomic studies show that the cerebellum plays an integral part in the pathophysiological and treatment of ADHD. Visual-motor integration, motor coordination, and visual perception are associated with students' academic achievement. This shows that ADHD children can have lower academic achievement than other children. Research also shows that the dexterity level of children with ADHD is lower compared to other children. Recent studies show that children with ADHD demonstrate slower growth of cerebellar white matter. Since dexterity is linked to cerebellum and visuomotor coordination, children with ADHD can have difficulty working on certain jobs in their adulthood if not treated well.

METHODOLOGY

Sample

The sample consists of 55 boys from age group of 7-13 years. The sample selected was diagnosed by a clinical psychologist based on ICD criteria and screening tools. The parents of the sample were utilized for administering the parent rating scale for Attention Deficit Hyperactive Disorder. The same parent was called again after 3 months of therapy for reassessment.

Instrument Used

Instrument for assessment

- ***Parent Rating Scale for Attention Deficit Hyperactivity Disorder (ADHD)*** – this is a diagnostic tool for ADHD. It consists of 10 questions to be answered by parent on a 4 point scale where score above 12 points to ADHD.

Instrument for Instrumentum Psychotherapy

- ***Finger dexterity apparatus*** – the Finger Dexterity developed by O'Connor in 1926, is a standardized assessment of hand and eye coordination as well as fine motor control and consist of activity involving finger test. The O'Conner Finger Dexterity equipment with 100 pins which have to be filled in the metal box of 100 holes.
- ***Tweezer dexterity apparatus*** – Tweezer Dexterity developed by O'Connor (1926) is a test to assess visuomotor coordination. It measure the speed of an individual to pick up the pin, one at a time and place them in the holes of board on a metal or wooden plate. The board contains 100 holes, including one tweezer and 100 pins.

Procedure

ADHD children who came for treatment were selected for research, based on the consent of their parents. parent of the selected sample was administered the Parent Rating Scale for ADHD. After scoring the sample was given Instrumentum psychotherapy following these treatment steps.

1. Ventilation and information taking
2. Diagnostic assessment and diagnostic formulation.
3. Explanation of ADHD and its maladaptive behaviour to the parent along with parent counselling.
4. Explanation regarding instrumental approach, and how to give reinforcement and token economy.

Study on Effectiveness of Dexterity Apparatus as a Therapeutic Tool in ADHD (Instrumentum Psychotherapy)

5. Use of dexterity apparatus on continuous basis for three months, and usage of token economy along with dexterity training for reinforcement and better compliance of treatment by the child.

The apparatus usage pattern

- 1st 2 weeks finger dexterity apparatus was used three times.
 - 3rd week onwards 3 times finger dexterity apparatus and one-time tweezer dexterity apparatus
 - 5th week onwards 5 times tweezer dexterity apparatus.
 - 8th week to 3 months completion of 3 times the apparatus was filled by blindfolding the child.
 - Slight changes of these patterns was used based on the psychologist assessment
6. Weekly follow ups, where reassessment and motivation for usage was done for those who were using apparatus from home.
 7. The study was conducted on pretest- post-test design. The assessment of the Parent Rating Scale for ADHD was done after three months.

RESULTS

Table No: 1 Correlation between the pretest and post-test of the sample

Condition		N (number of samples)	M (Mean)	SD (Standard Deviation)	t-value
Pair 1	Pre-test	55	23.60	4.817	16.104*
	Post-test		12.49	6.321	

* $p \leq 0.05$

The result shows that training children with dexterity apparatus for almost three months can result in significant improvement in ADHD features. This shows the importance of finger dexterity and tweezer dexterity apparatus in the training and prognosis of ADHD.

DISCUSSION

The data of the current empirical study shows there is a significant improvement in the attention and concentration as well as in the visuomotor skills of the sample. The Instrumentum psychotherapeutic treatment method can produce significant improvement in ADHD. this method incorporates the Instrumentum Psychotherapeutic method along with other verbal psychotherapeutic methods to produce significant improvement in ADHD on a quicker basis.

REFERENCES

- Carames, C. N., Irwin, L. N., & Kofler, M. J. (2021). "Is there a relation between visual motor- integration and academic achievement in school-aged children with and without ADHD?", *Child Neuropsychology*, 28(2), 224–243. <https://doi.org/10.1080/09297049.2021.1967913>
- C. J. Linjo Ph.D. (2024) "My Studies on Psychological Instruments", Waynadu, Kerala, ISBN 9-789359-804286
- Fietsam, A. C., Tucker, J. R., Kamath, M. S., Huang-Pollock, C., Wang, Z., & Neely, K. A. (2022). "Manual dexterity and strength and in young adults with and without Attention-Deficit/Hyperactivity Disorder (ADHD)". *Neuroscience Letters*, 766, 136349. <https://doi.org/10.1016/j.neulet.2021.136349>

Study on Effectiveness of Dexterity Apparatus as a Therapeutic Tool in ADHD (Instrumentum Psychotherapy)

Lafayette Instrument Company, Inc. (2016). O'Connor Tweezer Dexterity Test User's manual [Manual]. https://www.ncmedical.com/images/pdf/NC70020_oconnor_tweezer_dexterity_test_020718.pdf

Raggio, D. J. (1999). Visuomotor perception in children with attention deficit hyperactivity disorder—combined type. *Perceptual and Motor Skills*, 88(2), 448–450. <https://doi.org/10.2466/PMS.88.2.448-450>

Acknowledgment

The author appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author declared no conflict of interest.

How to cite this article: Linjo, C.J. (2024). Study on Effectiveness of Dexterity Apparatus as a Therapeutic Tool in ADHD (Instrumentum Psychotherapy). *International Journal of Indian Psychology*, 12(3), 2358-2362. DIP:18.01.229.20241203, DOI:10.25215/1203.229