Chapter III
Method

This chapter explains the procedure for carrying out the present study, **"Enhancement of Cognitive Abilities among Learning Disabled".** It contains the Operational Definitions, Objectives, Hypotheses, Research Design, the Tools used for the data collection, the Sampling Technique used for the investigation, details of the Intervention Programme and the statistical techniques used to analyse the data.

- Operational Definitions
- Objectives
- Hypotheses
- Area
- Sample
- Inclusion Criteria
- Exclusion Criteria
- Tools
- Procedure
- Analysis of Data

Operational Definitions

Learning Disability

"Specific Learning Disability is a generic term that refers to a heterogeneous group of neuro behavioural disorders manifested by significant unexpected, specific and persistent difficulties in the acquisition and use of efficient reading (dyslexia) writing (dysgraphia) or mathematical (dyscalculia) abilities despite conventional instruction, intact senses, normal intelligence, proper motivation and adequate socio cultural opportunity"

Cognitive Abilities

"Cognitive ability may be defined as a "mental capability that involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience (Gottfredson, 1997). Sometimes referred as general intelligence, is essential for human adaptation and survival. (Plomin, 1999)

explained thatIt includes the capacity to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience"

Super Brain Yoga (Thoppukaranam)

Super Brain Yoga is a style of yoga that stimulates the earlobe acupressure points. People who do thoppukaranam normally grasp their earlobes between their thumb and forefinger, they have to repetitively perform squats with their hands crossed in front of their chest. This stimulates the brain and improves cognitive clarity by sending electrical signals to it. In India, yogic squats with certain hand positions are a physical activity of worshipping the deity.

Statement of the Problem

To find out the Efficacy of Thoppukaranam in enhancing the cognitive abilities among learning disabled children.

Objectives

- To assess the Cognitive Abilities of the Learning Disabled Children
- To Enhance the Level of Cognitive Abilities among the Learning Disabled Children
- To enhance the Level of intelligence among the Learning Disabled Children.
- To find out the efficacy of intervention in enhancing the cognitive abilities among the Learning Disabled Children.

Hypotheses

The following research hypotheses would be tested during the research

H 1, "There will be significant difference between Before, After and Follow-up phases in Raven's Coloured Progressive Matrices among the Learning Disabled Children in the Experimental Group"

H 2, "There will be significant difference between Before, After and Follow-up phases in Raven's Coloured Progressive Matrices among the Learning Disabled Children in the Waitlist Control Group"

H 3, "There will be significant difference between Before, After and Follow-up Phases in Visual Scanning of Delis Kaplan Executive Function System Trial Making Test among the Learning Disabled Children in the Experimental Group"

H 4, "There will be significant difference between Before, After and Follow-up Phases in Visual Scanning of Delis Kaplan Executive Function System Trial making Test among the Learning Disabled Children in the Waitlist Control Group"

H 5, “There will be significant difference between Before, After and Follow-up Phases in Number Sequencing of Delis Kaplan Executive Function System Trial Making Test among the Learning Disabled Children in the Experimental Group”

H 6, “There will be significant difference between Before, After and Follow-up Phases in Number Sequencing of Delis Kaplan Executive Function System Trial Making Test among the Learning Disabled Children in the Waitlist Control Group”

H 7, “There will be significant difference between Before, After and Follow-up Phases in Letter Sequencing of Delis Kaplan Executive Function System Trial Making Test among the Learning Disabled Children in the Experimental Group”

H 8, “There will be significant difference between Before, After and Follow-up Phases in Letter Sequencing of Delis Kaplan Executive Function System Trail Making Test among the Learning Disabled Children in the Waitlist Control Group”

H 9, “There will be significant difference between Before, After and Follow-up Phases in Number Letter Sequencing of Delis Kaplan Executive Function System Trail Making Test among the Learning Disabled Children in the Experimental Group”

H 10, “There will be significant difference between Before, After and Follow-up Phases in Number Letter Sequencing of Delis Kaplan Executive Function System Trail Making Test among the Learning Disabled Children in the Waitlist Control Group”

H 11, “There will be significant difference between Before, After and Follow-up Phases in Motor Speed of Delis Kaplan Executive Function System Trial Making Test among the Learning Disabled Children in the Experimental Group”

H 12, “There will be significant difference between Before, After and Follow-up Phases in Motor Speed of Delis Kaplan Executive Function System Trial Making Test among the Learning Disabled Children in the Waitlist Control Group”

H 13, “There will be significant difference between Before, After and Follow-up Phases of Verbal Fluency of Delis Kaplan Executive Function System among the Learning Disabled Children in the Experimental Group”

H 14, “There will be significant difference between Before, After and Follow-up Phases of Verbal Fluency of Delis Kaplan Executive Function System among the Learning Disabled Children in the Waitlist Control Group”

H 15, “There will be significant difference between Before, After and Follow-up Phases of Design Fluency of Delis Kaplan Executive Function System among the Learning Disabled Children in the Experimental Group”

H 16, “There will be significant difference between Before, After and Follow-up Phases of Design Fluency of Delis Kaplan Executive Function System among the Learning Disabled Children in the Waitlist Control Group”

H 17, “There will be significant difference between Before, After and Follow-up Phases of Colour Naming of Delis Kaplan Executive Function System Colour Word Interference test among the Learning Disabled Children in the Experimental Group”

H 18, “There will be significant difference between Before, After and Follow-up Phases of Colour Naming of Delis Kaplan Executive Function System Colour Word Interference test among the Learning Disabled Children in the Waitlist Control Group”

H 19, “There will be significant difference between Before, After and Follow-up Phases of Inhibition of Delis Kaplan Executive Function System Colour Word Interference test among the Learning Disabled Children in the Experimental Group”

H 20, “There will be significant difference between Before, After and Follow-up Phases of Inhibition of Delis Kaplan Executive Function System Colour Word Interference test among the Learning Disabled Children in the Waitlist Control Group”

H 21, “There will be significant difference between Before, After and Follow-up Phases of Inhibition and Switching of Delis Kaplan Executive Function System Colour Word Interference test among the Learning Disabled Children in the Experimental Group”

H 22, “There will be significant difference between Before, After and Follow-up Phases of Inhibition and Switching of Delis Kaplan Executive Function System Colour Word Interference test among the Learning Disabled Children in the Waitlist Control Group”

H 23, “There will be significant difference between Before, After and Follow-up Phases of Word Context of Delis Kaplan Executive Function System among the Learning Disabled Children in the Experimental Group”

H 24, “There will be significant difference between Before, After and Follow-up Phases of Word Context of Delis Kaplan Executive Function System among the Learning Disabled Children in the Waitlist Control Group”

Population and Sampling Frame

Location of the Study

The location selected to conduct the study was Vidya Vikasini opportunity school for persons with Intellectual disability which is located in Coimbatore was selected for the data collection. The students from class III to V were selected to serve as the sample. The data was collected and intervention was administered for the Learning Disabled Children

The reason for selecting this area was

- Availability of the samples required for the study.
- Willingness and Cooperation of the students in the school.
- Permission and Facilities provided by the authorities to conduct the action research.

Sampling Procedure

The participants were selected using purposive sampling, since the study had Experimental and Waitlist control group, the participants were allotted randomly in the groups using simple random method. From the above-mentioned schools of Coimbatore, Tamilnadu, 60 Girls and Boys (8-12 years), those include children with Learning Disability. The Phases I, II and III of the study involved 30 Learning Disabled Children in the Experimental Group and 30 Learning Disabled Children in the Waitlist Control Group. Formal Written Informed Consent was taken from all the Learning Disabled Children' parents.

Inclusion Criteria

- The age range Between of 8-12 years
- The Learning Disabled Children with Low level of Intelligence were selected
- The Learning Disabled Children who lacked performing well in academics were selected.

Exclusion Criteria

- The Learning Disabled Children above 12 years were excluded
- Adolescents were excluded
- Learning disabled with High Intelligence were excluded.
- Learning Disabled Children who performed well in academics were excluded.

Research Design

The research design used were, "Before, After and Follow-up with Waitlist Control Design". The primary data was obtained from the sample through Standardized Questionnaires and Schedules. The data collection for present research took place in three phases.

Phase-I: The first phase included selection of students from Vidya Vikasini opportunity school for persons with Intellectual disability as the Learning Disabled Children

Phase-II: In the second phase Learning Disabled Children who are assigned in experimental group were assessed for their baseline cognitive abilities using the psychological tools

Group-I: Experimental Group with Intervention

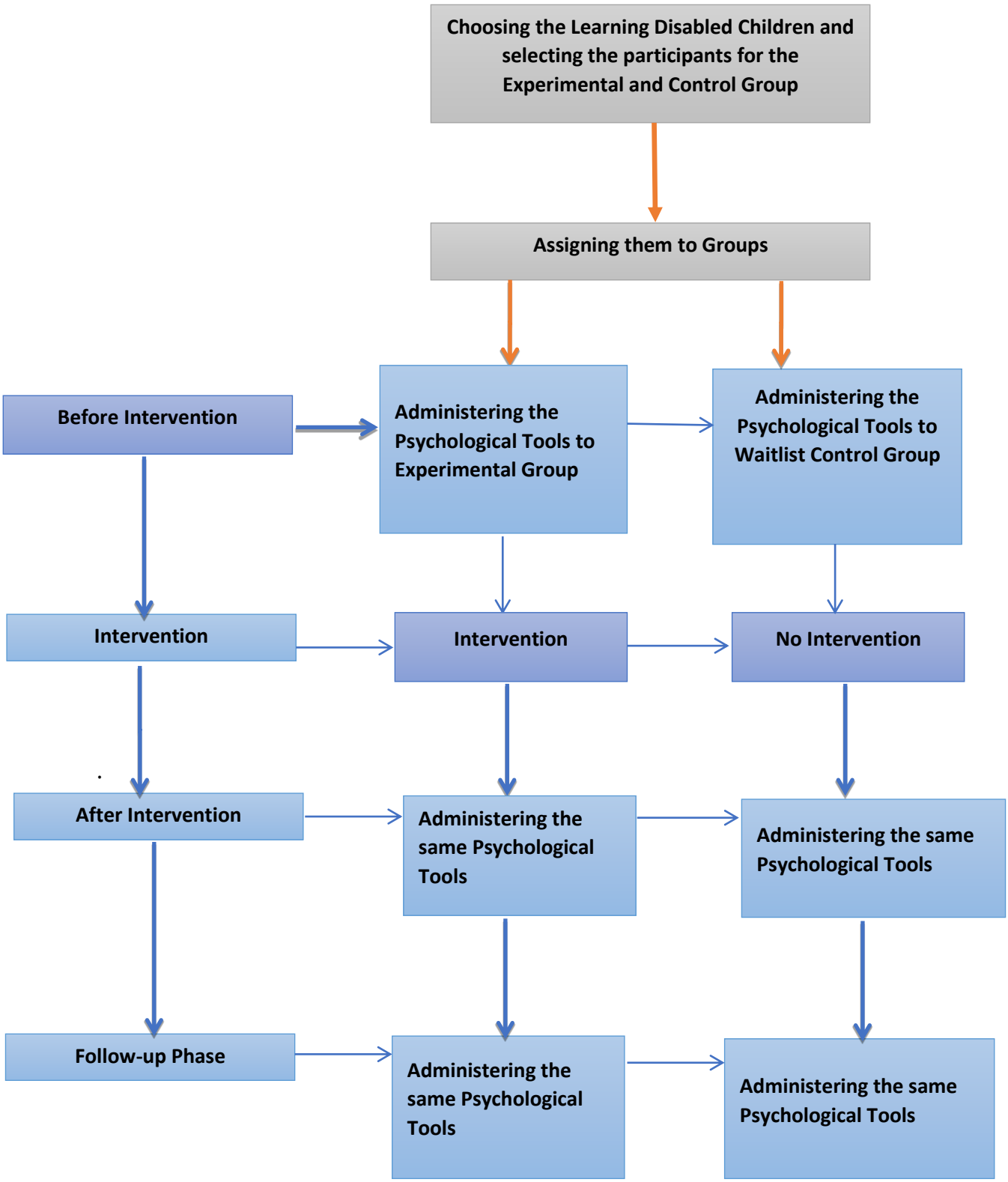
Group-II: Waitlist Control Group without Intervention

Phase-III: In the Phase-III, after the Interventions, all the Learning Disabled Children in the experimental group were re-assessed for their cognitive abilities using the psychological tools; Learning Disabled Children underwent re-assessments using the same psychological tools as follow-up. The effectiveness of the interventions was ascertained by comparing the groups Before intervention, After intervention and follow-up assessment of cognitive abilities.

Data collection Procedure: Case study schedule was collected as Personal profile sheet from the participants, since they come from a small age group the basic information was collected. Participants were further allotted in two groups, Group-I consisted of participants who participated in the intervention (Experimental group) and Group-II consisted of participants who did not participate in the intervention (Waitlist Control Group). The data collected from the participants for the Before, After and Follow-up Phases were subjected to statistical analysis

Flow Chart

Before, After and Follow-up with Waitlist Control Group Design was used to conduct the research.



Tools of Investigation

The tools used in the study were

I. **Informed Consent Form**

II. **Case Study Schedule**

III. **Raven's Coloured Progressive Matrices**

IV. **Delis Kaplan Executive Function System**

The tools used in the study were in English therefore they were translated into Regional Language, Tamil and then translated back to English by an expert to reduce bias and ensure translation consistency.

Case Study Schedule/ Personal Profile Sheet (Yogeswarie&Dr.S.Gayatridevi, 2018) (Annexure-I)

Case Study Schedule/ Personal Profile Sheet was used to collect the required information about the Learning Disabled students; it was used to collect the demographic details of the Learning Disabled Children such as Name, Age, Education, Family Type and Place of Living

Raven's Coloured Progressive Matrices (Annexure- II)

Raven's Coloured Progressive Matrices were created for younger children, the elderly and those with moderate or severe learning disabilities, this test contains SET A and B from the conventional matrices, with a further set of 12 items added between the two, as Set Ab. Most items were present on a coloured background to make the test visually stimulating for Learning Disabled Children. However, the very last few items in Set B are presented as Black and White, Ravens, J.C.,1936

Delis Kaplan Executive Function System (Annexure - III)

Delis Kaplan Executive Function System is the first Nationally Standardized sets of test to evaluate higher cognitive functions in both children and Adults. Delis, Kaplan, and Kramer, (2001). From Delis Kaplan Executive Function System Trial Making Test, Design Fluency, Verbal Fluency, Colour Word Interference, Word Context test were selected in order to age of the Learning Disabled Children

Trial Making Test

The primary part of Trial Making Test (TMT), "Trial Making Test A requires the subject to rapidly sequence numbers from 1 through 25, with the score being the time to complete the task. The secondary part, Trial Making Test B is a more difficult cognitive flexibility task requiring the subject to follow a sequential pattern while shifting cognitive sets, sequencing from 1 to 13 while switching Between Before, After and Follow-up Phases of numbers and letters, with the score being the time to complete the task" (Kaplan, 2001)

Verbal Fluency

The Delis Kaplan Executive Function System, "Verbal Fluency test is comprised of three testing conditions: Letter Fluency, Category Fluency and Category Switching. The Verbal Fluency measures multiple aspects of verbal behaviour productivity and cognitive flexibility. It evaluates effectiveness of novel and semantic search strategies. The process approach enables further evaluation of self monitoring" (Kaplan, 2001)

Design Fluency

The Delis Kaplan Executive Function System, "Design Fluency Test is typically assumed to assess planning, cognitive flexibility and fluency in generation of visual patterns above and beyond contributions from motor speed" (Kaplan, 2001)

Colour Word Interference Test

The Delis Kaplan Executive Function System, "Colour Word Interference Test was designed to improve upon the Stroop task by including an inhibition/ switching trial, which was designed to be more difficult than the inhibition trial in terms of time to completion and number of errors". (Kaplan, 2001)

Word Context Test

The Delis Kaplan Executive Function System, "Word Context Test is a means of evaluating executive functions in the verbal modality and assessing such skills as deductive reasoning, integration of multiple bits of information, hypothesis testing and flexibility of thinking". (Kaplan, 2001).

Scoring

Scoring was done using the Manual and the Scoring Key of each of the Tools used for the data collection.

Intervention Phase

Thoppukaranam (Super Brain Yoga) was used in the study

Thoppukaranam

Thoppukaranam is otherwise called as super brain yoga, which has empowered individuals to accomplish psychological, physical and spiritual wellbeing. Thoppukaranam (Super Brain Yoga) is being practiced traditionally from ancienteducational institutions. It was accepted from the ancient Gurukalam Education systems. It is also called as “Uthaik-Bathaik” in hindi or in tamil “Thoppukaranam”. It is confirmed yogic practice for people who wish to perform the steps while offering prayers, rather than a sort of punishment in the classroom as is commonly known in the Indian educational system. The, “Thoppukaranam” (Super Brain Yoga) according to Hindu yogis, awakens the brain’s energy connections. Thoppukaranam (Super Brain Yoga) is a well known yogic procedure derived from the terms “Thorpe” meaning “hands” and “Karanam” meaning “ears”. It is thought to increase mental attention in order to stimulate the sections of the brain, resulting in a better sense of awareness.

Steps to Follow inThoppukaranam

1. Individuals were made to Stand straight and slightly raise your head and back. Allow the lengthening of your torso, front back and spine. Maintain a wide shoulder girdle and keep your feet flat on the ground.

2. Tongue will be placed on roof of your mouth

3. Place your left hand on your right earlobe and your right hand on your left earlobe.

Benefits of practicing Thoppukaranam

- Thoppukaranam (Super Brain Yoga) synchronises and co-ordinates alpha thinking waves, it also stimulates and activates the cerebrum
- It gives you a new perspective and it relieves tension and stress
- Cerebrum has a direct impact and results in sharp response
- It controls the intimating drives

- Practicing Thoppukaranam improves concentration and develops mental power

Statistical Analysis

The methods of Statistical Analysis using SPSS V 26 would be Mean, Standard Deviation, Repeated Measures ANOVA and Post-hoc tests. Since Alternate Hypothesis was framed, and about 24 hypothesis statements was written, since the study consisted alternate hypothesis, the homogeneity tests was not carried out.