3.1. **AIMS**

1. To assess the level of cognitive (attention, memory and intellectual ability) and psychosocial aspects (adjustment, self concept and social problem solving skills) among the tribal children.

2. To study the effect of intervention programme on cognitive (attention, memory and intellectual ability) and psychosocial aspects (adjustment, self concept and social problem solving skills) among the tribal children.

3.1. **OBJECTIVES**

1. To assess the level of cognitive (attention, memory and intellectual ability) and psychosocial aspects (adjustment, self concept and social problem solving skills) among the 4th, 5th, and 6th standard tribal children.

2. To study the effect of the intervention programme on promotion of cognitive (attention, memory and intellectual ability) and psychosocial aspects (adjustment, self concept and social problem solving skills) among 4th, 5th, and 6th standard tribal children.

3. To study the significant difference between experimental group (with intervention) and control group (without intervention) on cognitive (attention, memory and intellectual ability) and psychosocial aspects (adjustment, self concept and social problem solving skills) among 4th, 5th, and 6th standard tribal children.

4. To study the gender difference in cognitive abilities (attention, memory and intellectual ability) and psychosocial aspects (adjustment, self concept and social problem solving skills) among 4th, 5th, and 6th standard tribal children of experimental group and control group.

5. To study the correlation between attention, memory and intellectual ability among experimental group and control group.
6. To study the correlation between adjustment, self concept and social problem solving skills among experimental group and control group.

3.3. HYPOTHESES

Ha1. There will be a significant improvement in cognitive abilities among experimental group after intervention programme.

a. There will be a significant improvement in attention among experimental group after intervention programme (for overall sample; and girls and boys separately).

b. There will be a significant improvement in memory among experimental group after intervention programme (for overall sample and girls and boys separately).

c. There will be a significant improvement in intellectual ability among experimental group after intervention programme (for overall sample and girls and boys separately).

Ha2. There will be a significant improvement in psychosocial aspects among experimental group after intervention programme.

a. There will be a significant improvement in adjustment among experimental group after intervention programme (for overall sample and girls and boys separately).

b. There will be a significant improvement in self concept among experimental group after intervention programme (for overall sample and girls and boys separately).

c. There will be a significant improvement in social problem solving skills among experimental group after intervention programme (for overall sample and girls and boys separately).

Ha3. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on cognitive aspects (for overall sample and girls and boys separately).
a. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on attention (for overall sample and girls and boys separately).

b. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on memory (for overall sample and girls and boys separately).

c. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on intellectual ability (for overall sample and girls and boys separately).

**Ha4. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on psychosocial aspects.**

a. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on adjustment (for overall sample and girls and boys separately).

b. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on self concept (for overall sample and girls and boys separately).

c. Experimental group children (with intervention) will be significantly better than control group children (without intervention) on social problem solving skills (for overall sample and girls and boys separately).

**Ha5. There will be gender difference in cognitive abilities among experimental group and control group.**

a. There will be gender difference in attention among experimental group and control group.
b. There will be gender difference in memory among experimental group and control group.

c. There will be gender difference in intellectual ability among experimental group and control group.

**Ha6. There will be gender difference in psychosocial aspects among experimental group and control group.**

a. There will be gender difference in adjustment among experimental group and control group.

b. There will be gender difference in self concept among experimental group and control group.

c. There will be gender difference in social problem solving skills among experimental group and control group.

**Ha7. There will be a significant positive correlation between attention, memory and intellectual ability among experimental group and control group.**

**Ha8. There will be a significant positive correlation between adjustment, self concept and social problem solving skills among experimental group and control group.**

### 3.4. OPERATIONAL DEFINITIONS

1. **Effect**

   It is measured in terms of significant difference between the performance/scores on different tests before and after the intervention programme.

2. **Intervention programme**

   A comprehensive package of play way intervention programme consisting of different activities like art and craft work; games and play; word and vocabulary games; number games and cultural activities. The aim of the intervention programme was to
promote development of the individual assessed in terms of some cognitive aspects (attention, memory and level of intellectual functioning) and some of psychosocial aspects (adjustment, self concept and social problem solving ability).

3. **Tribal children**

School children studying in 4th, 5th, and 6th standard, aged between 9 and 12 years (both boys and girls) and studying in Ashrama schools (schools run by Social Welfare Department of Karnataka Government exclusively for tribal children living in Hegada Devana Kote forest area).

4. **Cognitive aspects**

Some cognitive aspect involving attention, memory and intellectual ability.

5. **Psychosocial aspects**

Some psychosocial aspects involving adjustment, self concept and social problem solving skills.

6. **Attention**

Attention is the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things. In the study it is assessed through single and double digit cancellation for a fixed period of time (Kapur & Uma, 2003).

7. **Memory**

Memory is the means by which one can retain and draw on the past experiences to use that information in the present. In the study Memory for children is assessed on aspects of Personal Information, Mental Control, Sentence Repetition, Logical memory (Story recall – immediate and Story recall-delayed), Word recall (Meaningful), Digit Span (Digit forward and Digit Backward), Bentons Visual Retention Test and Paired Associate Learning and Cattell’s Retentivity Test (Barnabas, Subbakrishna, Kapur, Uma and Sinha, 2002).
8. **Intelligence**

Intelligence is the ability to deal with cognitive complexity (Gottfredson, 1987). In the study intelligence is assessed as a person’s present clarity of observation and level of intellectual development (Raven, 1965).

9. **Adjustment**

Adjustment is individual’s orientation towards his parents, peers, school and himself, in terms of the satisfaction he derives from his interactional relationship with these significant others, and himself (Pareek et al., 1975).

10. **Self-concept**

Self-concept is a cognitive appraisal of our physical, social, and academic competence (Eggen & Kauchak, 1999). In the study self-concept is assessed on areas of behaviour; intellectual and school status; physical appearance and attributes; anxiety; popularity; happiness and satisfaction (Ahluwalia, 2002).

11. **Social problem solving skills**

The social problem solving skills involve a core of thinking skill such as the ability to understand signs of one’s own and others feelings, the ability to decide on one’s goals and the ability to think in terms of long and short term consequences for both oneself and others. In the present study social problem solving skills is assessed on three aspects of interpersonal sensitivity; problem analysis and action; and specificity of planning (King, 1986).

3.5. **VARIABLES**

3.5.1. **Independent variables**

- The intervention programme consisting of art and craft work; games and play; word games; number games and cultural activities were considered as independent variable.
A Socio-demographic variable of gender was considered as independent variables.

3.5.2. Dependent variables

Performance of the individuals on cognitive aspects such as attention, memory, and intellectual ability; and psychosocial aspects such as level of self concept, adjustment and social problem solving skill were considered as dependent variables.

3.6. RESEARCH DESIGN

A before - after, experimental – control group design with post assessment after three and half months of the pre assessment was adapted for the study.

3.7. SAMPLE

Table 3.1

Sample selected across class and gender

<table>
<thead>
<tr>
<th>Age range</th>
<th>Class</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Over all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
</tr>
<tr>
<td>9 - 10 years</td>
<td>4th std</td>
<td>50</td>
<td>51</td>
<td>101</td>
</tr>
<tr>
<td>10- 11 years</td>
<td>5th std</td>
<td>46</td>
<td>47</td>
<td>93</td>
</tr>
<tr>
<td>11-12 years</td>
<td>6th std</td>
<td>23</td>
<td>37</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>119</td>
<td>135</td>
<td>254</td>
</tr>
</tbody>
</table>

The sample consisted of 375 Ashrama school children of 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> standard, aged between 9-12 years. Ashrama schools are a group of institutions run by the Social Welfare Department of Karnataka Government at tribal areas to cater to the educational needs of only tribal children. Entire sample of 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> standard Ashrama school children in the area of Hegadadevana Kote was considered for the study.
The process of sample selection representation (4th, 5th, and 6th standard)

Population
Unit
11 Tribal Ashram Schools
800 children – 1st std to 7th std

Purposive sampling

Unit
11 Tribal Ashram Schools
500 children – 4th to 6th std

Existing sample

Sub Unit

4th std
5th std
6th std

Administration of CBQ
Elimination of individuals below cut off point for analysis

4th std
5th std
6th std

Total of children
Both boys and girls aged between 9-12 years

3.7.1. Inclusion Criteria

- Tribal children studying in Ashrama schools only were considered for the study.
- Both boys and girls studying in 4th, 5th, and 6th standard aged between 9 to 12 years were considered for the study.
- Children having at least 90% of attendance during intervention programme were considered for the study.
- Children who were not exposed to other intervention activities apart from their regular schooling programme were considered for the study.
3.7.2. **Exclusion Criteria**

- Children scoring above cutoff point on Children’s Behaviour Questionnaire (CBQ) which is an indication of considerable behavioural problem were not included for analysis.
- Children with any major physical disability were also not included for the analysis.

3.8. **TOOLS**

1. Children’s Behaviour Questionnaire (Rutter, 1967)
2. Number Cancellation Test/Speed and Accuracy Test (Kapoor, 1972)
3. Test of Memory or Children (Barnabas et al., 2002)
4. Coloured Progressive Matrices (Raven, 1965)
5. Pre Adolescent Adjustment Scale (Pareek et al., 1975)
6. Children’s Self Concept Scale (Ahluwalia, 2002)
7. Group Social Problem Solving Assessment (King, 1886)

**Description of the tools: The tools numbered one to seven are described below**

1. **Children’s Behavior Questionnaire** (CBQ; Rutter, 1967).

Rutter’s proforma A and B are screening instruments to be completed by teachers. The CBQ is in the form of a questionnaire, with descriptions of the student’s classroom behaviour and academic achievement.

   Proforma A pertains to scholastic ability and achievement. Proforma ‘B’ deals with behavioral problems of psychological nature. It consists of 26 descriptions of behaviors against which the teacher is asked to indicate whether each such description ‘does not apply’, ‘applies somewhat’ or ‘definitely applies’ to the child in question. These ratings of each item are scored 0, 1, 2 respectively and the scores are added together to produce a total score.
Rutter (1967) found that a cut off score of nine or more had a discriminative value. Rutter et al., (1970) found a cutoff score of nine or more had a discriminative value for identifying the disturbed children. The internal consistency of the scale was determined by examining the pattern of inter correlations between items in the scale, the individual items which differentiate high scores on the scale and the factor structure of the questionnaire in each of the two populations compared (Rutter & Graham, 1968). Test-retest reliability of proforma B is 0.89 over a three month period and inter- rater reliability is 0.72 to discriminate between children attending a child guidance clinic and children in the general population (Rutter, 1967, Rutter et al., 1970). Zimmerman, Mingletti, Tacconi, and Tansella, (1978) established that Rutter proforma had test-retest reliability of 0.80 in a 3 to 5 months interval between the ratings and inter-rater reliability was only 0.50. Zimmerman et al., (1978) established that 34 out of 41 cases could be correctly identified by the tool, showing a sensitivity of 0.83. In Shenoy’s (1992) study it was found that for this scale inter rater reliability was 0.84 and test-retest reliability was 0.75.

The Children’s Behavior Questionnaire (CBQ) has been used as a screening instrument in different population so children in Aberdeen (Rutter, 1967), in the Isle of Wight (Rutter et al., 1970), with London school children (Rutter, 1967) and with children in long term residential care (Wolkind, 1974). This scale is used in many Indian studies by John (1980), Parvatha Vardhini (1983), Savithri (1986), Uma (1988), Sarkar (1990), Rozario, Kapur and Kaliaperumal (1990) and Shenoy (1992).The Kannada Version of the CBQ was also made use of by Parvatha Vardhini (1983).

The Children’s Behavior Questionnaire (CBQ) was chosen for the study to identify children with behavioural problems of psychological nature.
2. **Number Cancellation Test/ Speed and Accuracy Test** (SAT; Kapoor, 1972)

This test is used to assess attention and concentration. The test consists of a sheet with random numbers ranging from 1 to 9. This sheet is presented to the subject, and on simple cancellation task the subjects are asked to cancel a given digit as quickly as possible for a period of 60 seconds and later the total number of correct digits cancelled, number of digits omitted and number of wrong digits cancelled are counted (toted) separately. On double digit cancellation two digits are assigned for the subject to cancel for a period of 60 seconds and later the total number of correct digits cancelled, number of digits omitted and number of wrong digits are counted separately.

This type of test is also used to assess the level of attention and concentration in NIMHANS index of Specific Learning Disability Battery (Kapur, Rozario, & Oommen, 1991). This test was used by Kapur and Uma (2003) on a rural sample of 800 students and found that this test was sensitive enough to assess the level of attention and concentration in children (eight-fifteen years). They had used this as a test (for 60 seconds), and the same procedure of administration and scoring was followed for this study.

Number Cancellation Test was considered for this study to assess the attention and concentration of children. It was selected as it was found to be sensitive enough to assess the level of attention and concentration in children (eight to twelve years). It could be administered at a group level and found to be a simple way of assessing attention.

3. **Test of Memory for Children** (Barnabas et al., 2002)

The Test of Memory for Children consist of 12 sub tests (147 items) namely – Personal Information, Mental Control, Sentence Repetition, Logical memory (Story
recall – immediate and Story recall-delayed), Word recall (Meaningful), Digit Span (Digit forward and Digit Backward), Benton’s Visual Retention Test and Paired Associate Learning and Cattell’s Retentivity Test.

The scores on each subtest and the total scores of all subtests can be converted to percentile ranks, for each age group. Norms are available for children in the age group of seven to eleven years.

The test-retest reliability of the whole battery is found adequate ranging from 0.51 to 0.97 for different sub tests. Validity in terms of internal consistency among the subtests and correlation of different test scores with total memory score had been calculated that range from 0.27 to 0.78. Content validity of the test has been established through the use of consensus among five experts on adequacy and represents activeness of the sampling domain in the items of the sub tests. Construct validity in the scale in the form of factorial validity has been established. Profile analysis on all the sub tests for normal children is available.

This test of memory for children was considered because, this test battery covers wide dimensions of 12 sub tests (147 items) for assessing memory process (measuring different aspects of memory and employing different methods of recall) of children, standardized on Indian Children. It is suitable specifically for children aged between seven to eleven years and norms being available for the same age range with adequate reliability and validity. All subtests separately as well as the full tests are found to be stable. The raw scores could be converted into percentile ranks for each sub test. And also profile analysis on all sub tests for normal children is available.

4. **Colored Progressive Matrices** (CPM; Raven, 1965).

The Colored Progressive Matrices is designed to assess as accurately as possible a person’s present clarity of observation and level of intellectual development. Each
problem in the scale is really the source of a system of thought, while the order in which the problems are presented provide the standard training in the method of working, hence the name progressive matrices.

The three sets (A, Ab, B) of 12 problems constituting the colored matrices are arranged to assess the chief cognitive processes. The three sets together provide three opportunities for a person to develop a consistent theme of thought, and the scale of 36 problems as a whole is designed to assess as accurately as possible, mental development up to intellectual maturity. The Colored Matrices Scale A, Ab, B are arranged to assess mental development up to the stage when a person is sufficiently able to reason by analogy to adopt this way of thinking as consistent method of inference.

A test-retest reliability (interval of 3 months period) of Colored Progressive Matrices for six and half to twelve and half (6½- 12½) years aged normal school children was found to be 0.89. The internal consistency (Correlation) between sets of A-Ab, Ab-B, and A-B was found to be .82, .76 and .68 respectively. The reliability of the Colored Progressive Matrices has been investigated in several studies. Jordan (1965) reported that Raven’s Colored Progressive Matrices is internally consistent and found no difference in ability estimates between genders and among ethnic group.

The Colored Progressive Matrices was selected for this study as is designed to assess a person’s present clarity of observation and level of intellectual development, standardized for age group of children between five to twelve years of age. It could be administered for a group of individuals at the same time.

5. **Preadolescent Adjustment Scale** (PAAS; Pareek et al., 1975).

The Adjustment Scale is a 40 item self-report scale, with a Yes/No formal, that defines adjustment as the individual’s orientation towards parents, peers, school and
self, in terms of the satisfaction derived from interactional relationships with these significant others and self. This scale yields separate scores in five areas; home, school, peers, teachers and general, along with an overall score for total adjustment.

The scale was developed using Thurston’s method of equal appearing intervals using 190 judges. It has been validated with teacher’s rating of adjustment and three month test-retest reliability was adequate. The adjustment scale has been used in Indian studies (Arulmani, 1991; Dalal, 1989; Nandhini, 1996; Rozario 1988; Sinha, 1997). Scale values are positive as well as negative for different items. Scores for each sub scales are obtained by adding scale values of the items checked. High positive scores indicate high adjustment in that area, while high negative scores indicate high maladjustment. Scores near zero indicate mild adjustment or maladjustment depending on the direction of the scores. The total adjustment score is obtained by adding scores on all the sub scales.

This scale was selected since it has been validated on a sample of Indian children and assesses adjustment in different relevant domains.

6. **Children’s Self-concept Scale** (Ahluwalia, 2002).

The present scale has been prepared after the well known Piers-Harris, Children’s self-concept scale (1969). The test contains eighty items with ‘Yes’ or ‘No’ responses. It includes fourteen lie items to detect whether the children and adolescents have filled it accurately or not. It is a verbal paper-pencil test. The six sub scales of the tool are behaviour; intellectual and school status; physical appearance and attributes; anxiety; popularity; happiness and satisfaction.

The scale items are scored in a positive or negative direction to reflect the evaluation dimension. A high score on the scale is presumed to indicate a favourable self-concept, which is interchangeable with the term “self-esteem” or “self-regard”.


The scoring procedure for the self-concept scale is simple. The items are scored in the direction of high (adequate) self-concept according to the scoring stencil. One score is to be awarded to each statement either for ‘Yes’ or ‘No’ as given by the author. The maximum score for the total self-concept scale can be 80, whereas the minimum score can be Zero.

The scale is a popular instrument for measuring self-concept. Various samples have been used for different studies and this scale has been widely administered and adequately analyzed. In different studies (Sharma, 1985; Malik, 1984; Pandey, 1984; Pastor, 1980; Roy, 1976) 1,663 students of Uttar Pradesh (Balrampur, Banaras, Gonda, Faizabad, Lucknow, Kanpur, Rae Bareli, & Gorakhpur) and 1,278 students of Madhya Pradesh (Sagar and Gwalior) were taken as a sample for various studies and standardization.

The scale has adequate test retest reliability and split half reliability. The validity of the self-concept scale has been determined in two ways that is Face Validity and Concurrent Validity. The content validity of the self-concept scale was determined by “Translation and Back Translation method”. Evidently, the instrument has face and content validity of high order. In order to ascertain concurrent validity of the self-concept scale, the scores from each sub-scale were inter-correlated. The inter-correlations range from .397 to .621. The sub-scale behaviour and intellectual and school status appear to correlate higher with most other measures of self-concept.

The scale has been used successfully for children and adolescents who can read and write, of school classes from class three to class twelve. Because of difficulties in reading in primary school classes instructions and items could be read aloud by the test administrator. It has been found desirable to read the instruction and items aloud even with middle school and secondary school classes.
This test was selected for the study as it is designed to assess the self-concept which is considered to be important in the psychological world of childhood and adolescence, and is a popular instrument for measuring self-concept. It is standardized for children of school classes from class three to class twelve. It has been found desirable to read the instruction and items aloud to primary school classes and even with middle school and secondary school classes.

7. **Group problem solving skills assessment** (King, 1986)

King (1986) developed a scale on “Group Social Problem Solving Assessment” (GSPSSA). This questionnaire provides a rough screening of children’s knowledge of the social decision making steps. Group social problem solving skills assessment tool is a paper pencil test with 26 items which has items spanning five areas such as feelings (eight items), problems (seven items), solutions (three items), consequences (four items) and making solutions work (four items). This is used in the monitoring social decision making, generating the solutions and in making personalized adaptations when necessary. The five areas are further summarized into scores on interpersonal sensitivity; problem analysis and action; and specificity of planning.

The Group social problem solving skills assessment (GSPSSA) has in several field tests reliably identified students with deficits in any one of the three main social problem solving areas of a) Interpersonal Sensitivity b) Problem analysis and action and c) Specificity of planning. The scoring key is given in the manual and the comparison scores indicate whether the subject is at risk or average or highly skilled. The face validity was confirmed by three different raters. Statistical properties of the tool were found to be adequate by different researchers.
This scale was selected since this scale is best suited for grade three to six and generally doesn’t seem to be affected by reading level or vocabulary. The questionnaire could be administered both individually and in groups.

3.9. PROCEDURE

The investigation was carried out in two phases; a pilot study followed by the main study.

3.9.1. Phase 1: Pilot study. The pilot study was aimed at the following mentioned aspects

- Assessing the prevailing level of psychosocial stimulation/condition and deprivations of school children in the tribal areas.
- Developing and designing an Intervention Programme for development of cognitive and psychosocial aspects.
- Examining the suitability of the assessment tools and Intervention Programme.
- Results of the pilot study.
- Finalised intervention programme for main study.

3.9.2. Phase II – Main study

Procedure for the main study

Consent was obtained from Block Education Officer (BEO) and Director of Women and Social Welfare Department to conduct the study. Total of 10 schools were considered for the study. The study had to be carried on in the existing groups (schools).

Initially First batch of 4th to 6th standard (three Ashrama schools) children were taken for the study. Children were screened on Children’s Behavior Questionnaire. Information on the Children’s Behavior Questionnaire was obtained from school teacher. The children who scored above the cutoff point/score were
further considered for in-depth analysis and then referred to clinical psychologist and
primary health centers for further intervention. The other children were administered
the assessment tools. Number Cancellation Test, Colored Progressive Matrices,
Children’s Self-Concepts Scale, and Preadolescent Adjustment Scale, were
administered on a group of 10 members each. Test of Memory for Children and
Group Social Problem Solving Assessment had to be administered individually. Later
on children were grouped into small clusters of five to seven or ten individuals
depending on type of activities. The intervention programme was carried on. The
intervention programme consisted of five main activities namely art and craft work,
games and play, word and vocabulary activities, number games, and cultural
activities. Each activity was conducted on each day for one and half hours duration.
The activities were repeated for one and half months. Later the children were allowed
to carry on the programme, being supervised by trained personal for next two months
period. After three and half months of pre-assessment, post assessment was conducted
by administering post-assessment tools.

When the intervention programme for first batch (three schools) of children
was going on, simultaneously screening for second batch (three schools) of children
was started, continued by pre-assessment, intervention programme and post-
assessment. When the intervention programme for second batch of children was going
on, simultaneously screening for third batch (one school) of children and fourth batch
(two schools) of children was started. For third batch of children pre-assessment, intervention programme and post-assessment was done.

Batch four was considered as control group (waitlist) and hence after
screening and pre assessment intervention programme was not carried on. While post
assessment for third batch of children was going on, simultaneously post assessment
for fourth batch of children was also carried on. Later on the fourth batch of children were also given brief intervention on ethical grounds.

Procedure for the main study is represented as follows:

![Diagram](image)

### Figure 3.2. Diagrammatic representation of the Procedure for the main study
3.10. INTERVENTION PROGRAMME

3.10.1. The basic kit of materials required for the intervention programme was as mentioned below

- Kola sticks, bronze anklets, tambourines, and cymbals for dances.
- Carom board, draughts, ludo, snake and ladder, puzzles, chess board, marbles, shells, blocks, foam beads of different colors, shapes and sizes, throw balls, foot balls, volley ball, cricket set (optional), rubber balls, tennis balls, skipping ropes, badminton set, tennycot rings, and large plastic balls.
- Magazines, news papers, and story books.
- Abacus, number puzzles, picture puzzles, display cards with numbers, etc.
- First aid box.

3.10.2. The developed intervention programme consisted of five main activities namely

1. Art and Craft work
2. Games and Play
3. Word and Vocabulary games
4. Number games
5. Cultural and other activities

All these activities were not exclusively independent of each other, but actually overlapping in terms of their basic concepts. But for the sake of convenience in conducting the activities and recording, it was considered or divided into five main
activities. These activities were considered for the intervention programme, as there was enough of evidence that these activities would promote development in many areas of cognitive and psychosocial domains.

3.10.3. List of five main categories of activities involved in intervention programme package (Details- appendices).

1. **Art and Craft work:** Drawing, thread designs, scratched objects design, colored impression of objects, drawing on KG card board, sprinkles drawing, mural work, picture completion of incomplete design, me – through the age, art with coconut palm leaves, and craft work.

2. **Games and play activities:** sequential alternatives, reversal sequential alternatives activity, objects guarded, guarded objects, remembering displayed materials, remembering displayed materials and number, find the pincher, find the color, puzzles, observation and recall, sorting colours, sorting shapes, hopping – 2 leg, frog jumping , blind folded to catch others, hide and seek, blind man’s bluff, kavade, hopscotch, musical chair, kabadi, lagori, carom, draughts, ludo, snake and ladder, chess, throw ball, cricket, skipping, tennicoit, badminton, using building blocks, and clay work.

3. **Word and vocabulary games:** Naming games, naming words of specified letters, rhyming words, antakshari of words, construction of passage through sentence, description of environment around, story construction, storytelling and enacting, adding words to make descriptive sentence, three letter word construction, related words-generation, matching words on flash cards, identify the person, riddles and proverbs, observation and description, telephone game, letter and word cancellation, story writing, reading story books, top-down approach of reading, role play, calling out names sequence, and sentence completion.
4. **Number games:** Abacus, clapping for multiples, money games, read a clock, matching cards with numbers, shapes etc, multiply by sticks, number rhymes, objects of specified number, grouping of objects, pattern drawing, and spatial rotation.

5. **Cultural activities:** Singing, dance, kolata, mimicking animals and birds, mimicking day to day activity, outdoor drama, rhyme-tong twisters, pick and speak.

Table 3.2

Administration of tools in terms of informants and type of assessment (individual or group testing)

<table>
<thead>
<tr>
<th>Assessment Tools</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children’s Behavior Questionnaire</td>
<td>Information was collected from teachers.</td>
</tr>
<tr>
<td>Colored Progressive Matrices, Number Cancellation Test,</td>
<td>Were administered on a group of 10 members each.</td>
</tr>
<tr>
<td>Preadolescent Adjustment Scale and Children’s Self-Concepts Scale</td>
<td></td>
</tr>
<tr>
<td>Test of Memory for Children and Group Social Problem Solving</td>
<td>Was administered individually.</td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.3

Different activities and the duration of intervention programme

<table>
<thead>
<tr>
<th>Intervention programme carried on for a period of three and half month’s period</th>
<th>one and half hours duration</th>
<th>Once in a week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art and craft work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Games and play.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word and vocabulary activities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number games.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural activities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each group 84 days of one and half hours duration or 162 hours of activities was conducted.

3.11. **ANALYSIS OF DATA**

Data analysis was conducted using statistical techniques which included frequencies, percentages, independent and paired ‘t’ test, correlation and effect size estimates.

a. **Prevalence of Behavioral problems and Psychopathology**

The percentage of the sample that scored above the cutoff on the screening measures (CBQ) was computed.
b. Baseline scores on different cognitive and psychosocial aspects

The baseline scores on different cognitive and psychosocial aspects were computed based on the scoring keys of the respective assessment tools and the means and standard deviations of their scores were considered for interpretation.

c. Pre-intervention (Base line) comparison of the experimental and control group

Analysis was conducted to assess the equivalence of the experimental and control groups on relevant initial level of cognitive aspects and psychosocial aspects, using independent 't' test.

d. Pre-intervention and post-intervention mean scores comparison

Paired ‘t’ tests compared the pre-intervention and post-intervention mean scores of the experimental group. Paired ‘t’ tests compared mean scores of the control group at base line and after a three and half months period without intervention (after waitlist period).

e. Post-intervention comparison of the experimental and control group

Independent ‘t’ test compared the post-intervention mean scores of the experimental group and mean scores of the control group after a three and half months period without intervention (after waitlist period).

f. Effect size estimation

Effect Size (ES; Cohen, 1977) estimated of intervention outcome on different assessment tools was calculated.

\[ ES = \frac{Me - Mc}{s} \]

\( Me \) = Post-intervention mean score of the experimental group; \( Mc \) = Mean score of the control group after the period; \( S \) = Pooled standard deviation of the experimental and control groups.
\[ S = \sqrt{\frac{(n_e - 1) (sd_e)^2 + (n_c - 1) (sd_c)^2}{n_e + n_c - 2}} \]

\( n_e, n_c = \) sample sizes of the experimental and control groups; \( sd_e, sd_c = \) standard deviations of the experimental and control group after intervention and the waitlist period respectively.

g. Correlation

Correlation was computed to the correlation among different cognitive and psychosocial aspects for experimental and control groups.

3.12. ETHICAL CONSIDERATIONS

Ethical considerations included the aspects as mentioned below

- Obtaining of informed consent from the social welfare department.
- Detail examination of the individual once identified on screening tool.
- Providing of information about the options of further treatment or parental involvement where ever required.
- Intervention programme to control group after the waitlist period.