The aim was to assess the level of cognitive (attention, memory and intellectual ability) and psychosocial aspects (adjustment, self concept and social problem solving skills) and to study the effect of intervention programme on cognitive and psychosocial aspects among the tribal children studying in 4th, 5th, and 6th standard. Other objectives included studying gender difference and correlation among cognitive and psychosocial aspects. A before - after, experimental - control group design with post assessment after three and half months of the pre assessment was adapted for the study. The sample consisted of 375 Ashrama school (group of schools run by the Social Welfare Department of Karnataka Government at tribal areas to cater to the educational needs of only tribal children) children of 4th, 5th, and 6th standard, aged between 9-12 years from Hegadadevana Kote.

Of the 10 schools, some schools were considered as experimental group and others as control group. Existing group of children were screened on Children’s Behavior Questionnaire. The children who scored above the cutoff score were further not considered for analysis. The children were administered the assessment tools of Number Cancellation Test, Test of Memory for Children, Colored Progressive Matrices, Preadolescent Adjustment Scale, Children’s Self-Concept Scale, and Group Social Problem Solving Assessment. Later on children were grouped into small clusters of five to seven or ten individuals depending on type of activities. 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.

The data collected was further analysed using statistical techniques which included frequencies, percentages, independent and paired ‘t’ test, correlation and effect size estimates.

Conclusion: major findings of the study

1.1. Prevalence of problem in the Ashrama school going children as identified on Children’s Behaviour Questionnaire

- In the present study 5.6 per cent of children (Ashrama school children of 4th, 5th, and 6th standard) were identified as having problematic behaviour on Children’s Behaviour Questionnaire.
- This prevalence rate of 5.6 per cent was on the low side when compared to other studies, indicating, the prevalence rates were low in the present population.

1.2. Pre-intervention (base line) comparison of the experimental and control group on different assessment tools

- Analysis using independent ‘t’ test on different assessment tools and their sub tests were done for experimental and control group before the intervention to establish the base line scores comparisons on different tests and to check for homogeneity between the experimental and control group.
- Over all, the mean, and‘t’ values of different assessment tools done to check for homogeneity between the experimental and control group of tribal children indicated that except on two sub scales (total score of Double Digit Cancellation on Number Cancellation Test; and subtest of school on Pre Adolescent Adjustment Scale), there was no significant difference between the experimental group and control group pre intervention.
• Hence it was concluded that there was homogeneity between the experimental and control group and further it could be assumed that any difference on experimental group on these tests and subtests could be because of the intervention programme.

1.3. Pre-intervention (base line) scores and levels of the group on different assessment tools

• The average number of correct digits that was cancelled by tribal children for single digit cancellation and double digit cancellation indicated that the performance of the group was below average on Number Cancellation Test.

• Though the performance of the tribal children was adequate on some subtests, but overall total average scores of the group on the Test of Memory for Children was below 30th percentile which is not adequate. Average score secured on Colored Progressive Matrices was not adequate to the age range.

• The average scores obtained by the group on all the five areas of Preadolescent Adjustment Scale indicate that on all the areas the group as a whole is maladjusted.

• Except on two subscales of Children’s Self Concept Scale, on all the other subscales and on overall self-concept the group as a whole had below average self-concept.

• The average scores obtained by the children on all the three areas of Group Social Problem Solving Assessment indicated that on all the three areas the group as a whole is at risk i.e. the group on the whole is at risk in the monitoring social decision making, generating the solutions and in making personalized adaptations when necessary.
• Overall on all the assessment tools the group was not adequate to their age range which calls for immediate attention for need for intervention programmes to bring about a positive enhancement and change in cognitive and psychosocial areas.

1.4. Pre test-post test comparison of the experimental group and control group

• On number cancellation test the tribal children demonstrated a significant improvement for single digit cancellation and double digit cancellation after intervention. There was also significant difference between the means of control group before waitlist period and control group after waitlist period for single digit cancellation and double digit cancellation, but post waitlist period the scores on double digit cancellation had significantly reduced. This indicates that as the task is complicated the performance has decreased in control group.

• For experimental group on different sub tests of personal information, mental control, sentence repetition, delayed logical memory, word recall meaningful, word recall non meaningful, digit span forward, delayed response, picture recall, paired associate learning, retentivity test, and total score for Memory Test for Children there was significant improvement after intervention. But for the subtests of immediate logical memory, digit span backward, and BVRT there was no significant improvement. Except on the subtest of digit span backward, where there was significant improvement after waitlist period for control group on all the other different sub tests there was no significant difference between the means of control group before and after waitlist period.

• There was a significant improvement shown by experimental group (after intervention) and control group (after waitlist period) on Colour Progressive Matrices. Though both the experimental and control groups have improved, the
experimental group (after intervention) has improved more than control group (after waitlist period).

- Both On different subtests of Children’s Self Concept Scale there was significant improvement after intervention for experimental group (after intervention) and control group (after waitlist period) on different subtests of Children’s Self Concept Scale.

- There was significant improvement on different subtests of Pre Adolescent Adjustment Scale for experimental group after intervention but on significant improvement for control group after waitlist period on different subtests of Pre Adolescent Adjustment Scale.

- For experimental group on different subtests on Group Social Problem Solving Assessment there was significant improvement after intervention. Whereas there was no significant improvement for control group after waitlist period on different subtests of Group Social Problem Solving Assessment.

- Girls and boys of the experimental group have shown significant improvement in all cognitive and psychosocial aspects after intervention programme.

- Girls in the control group have shown significant improvement in self concept and significant decrease in complex attention task after waitlist period. Boys in the control group have shown significant improvement in self concept after the waitlist period; where as there is no significant difference in other cognitive and psychosocial aspects.

- The experimental group has shown significant improvement on more of the cognitive and psychosocial aspects when compare to control group after waitlist period, indicating that intervention programme had positive impact on many cognitive and psychosocial aspects.
1.5. Post-intervention comparison of the experimental and control group

- Over all, the mean and ‘t’ values on different tests and subtests for experimental post-group and control post-group was done to compare and see if there was significant difference between the experimental (after intervention) and control (after waitlist period). Results indicates that except on six sub scales (for the subtests of Delayed Logical Memory, digit span backward, and BVRT on Memory Test for Children) there was significant difference between the experimental (after intervention) and control on all the other tests and subtests. Experimental group (with intervention) was significantly better than control group (after waitlist period) on all the other tests and subtests. Hence it could be concluded that the difference on experimental group on these tests and subtests could be because of the impact of intervention programme.

- Girls and boys in the experimental group (after intervention) were significantly better in all cognitive and psychosocial aspects when compared to girls and boys in the control group (after waitlist period).

1.6. Effect size estimates of intervention programme outcome

- Overall Effect size estimates of intervention programme outcome on cognitive and psychosocial aspects can be summarized as follows:

- The effect size for single digit cancellation; subtests of Sentence Repitition, Delayed Logical Memory, Delayed Response of Test of Memory for Children; subtest of problem analysis and action in Group Social Problem Solving Assessment were of small range indicating small effect of intervention on these aspects.

- The effect size for double digit cancellation; Colour Progressive Matrices; subtests of Personal Information, Word Recall, Digit Span Forward, Non-meaningful,
Retentivity Test of Test of Memory for Children; different subtests of home, school, teachers’s, and general on Pre Adolescent Adjustment Scale; subtest of Specificity of Planning in Group Social Problem Solving Assessment the effect size was of medium range indicating medium effect of intervention on these aspects.

- On Mental Control, Word Recall Meaningful, Paired Associate Learning, and total score for Memory Test for Children; On total scores of Children’s self concept scale; On subtests of peers and total scores of Pre Adolescent Adjustment Scale in Group social problem solving assessment; on subtest of interpersonal sensitivity the effect size was of large indicating large effect of intervention on these areas.

- On many assessment tools the group has medium to large effect size showing that the intervention programme had improving effect on many cognitive and psychosocial aspects.

1.7. Gender difference comparison of the experimental and control group on different assessment tools

- For the experimental group (Before intervention) girls were significantly better on simple and complex attention task when compared to boys; whereas boys had significantly better self concept when compared to girls. There was no significant gender difference for intellectual functioning, memory, adjustment, and social problem solving skills.

- For the control group (Before intervention) girls had significantly better social problem solving skills when compared to boys; whereas boys had better self concept compared to girls.
• For the experimental group (after the intervention) there was no significant gender difference in any of the cognitive and psycho social aspects. For the control group (After waitlist period) the boys had significantly better self concept than girls. There was no significant gender difference for other cognitive and psycho social aspects.

• Gender differences did exist on some of the assessment tools which were in terms with other research findings of different researchers.

1.8. Relationship between attention, memory and intellectual ability among experimental group and control group/ Relationship between adjustment, self concept and social problem solving among experimental group and control group

• In experimental group (before intervention) and experimental group (after intervention) for cognitive aspects there existed significant correlation among Single Digit cancellation, Double Digit cancellation and Colour Progressive Matrices and Test of Memory mutually to one another indicating that as the scores in one area increases the scores in other area also increases.

• In control group (before intervention) and control group (after waitlist period) among cognitive aspects the single Digit cancellation is significantly correlated to Double Digit cancellation and Colour Progressive Matrices and Test of Memory; Double Digit cancellation is significantly correlated to Colour Progressive Matrices; Colour Progressive Matrices is significantly correlated to Test of Memory; whereas Double Digit cancellation is not significantly correlated to Test of Memory. Indicating that variations on Test of Memory will have no impact on Double Digit cancellation and vice versa.
In experimental group (before intervention) and control group (after waitlist period) for psychosocial aspects there existed no significant correlation among adjustment, self concept and group social problem solving skills mutually to one another indicating that as the scores in one area increases it has no impact on the scores in other area. In experimental group (after intervention) for psychosocial aspects there existed significant correlation between adjustment and self concept, whereas there was no significant correlation between other psychosocial aspects.

In control group (before intervention) for psychosocial aspects there existed significant correlation between self concept and group social problem solving skills indication the influence of one area on the other; whereas there was no significant relationship between other areas of adjustment, self concept and group social problem solving skills indicating that as the scores are independent of each other.

Generally it can be seen that cognitive aspects are correlated to one another, whereas psychosocial aspects are not correlated showing that psychosocial aspects are more independent in nature than the cognitive aspects where there could be influence of one aspect on another.
CRITICAL EVALUATION

Strengths:

1. The study was conducted specifically at remote tribal, with several problems in terms of transport facility, forest area and frequent encounters with wild animals.

2. A survey of all the tribal areas were was done for assessing and exploring the prevailing level of psychosocial stimulation/condition and deprivations of school children in the tribal areas.

3. Workshops were conducted for teachers before and after the intervention programme to ensure that they understand the rationale behind the intervention programme and to prevent their intrusive directive directions to children during the intervention and to access feed back after the intervention programme. Teachers were also handed over manuals named Manual for School Teachers on Child Development, Mental Health and Disabilities (Kapur and Uma, 2003).

4. ‘Hadi’ visits were made and parents counseled to send the drop out children back to school, which was to an extent successful.

5. Basic materials required for conducting the intervention programme were given to children and some other materials provided for the school on request of the teachers.

6. Pilot study was conducted to examine the suitability of the available assessment tools, to derive at appropriate scoring pattern and to examine the suitability of intervention Programme and for making suitable modifications.

7. Psychometrically sound screening tools such as Children’s Behavior Questionnaire (CBQ) were used to identify behavioral problems and for detecting individuals with psychological disturbances in children.
8. Individuals identified on screening tool were subjected to detailed examination. Information about the options of further treatment was provided and necessary medical/clinical assistance was provided if required.

9. Specifically keeping in mind the accessibility of tools and the availability of time some important developmentally appropriate outcome measures in terms of cognitive aspects like attention, memory, intellectual functioning; and psychosocial aspects like self concept, adjustment, social problem solving ability were used.

10. Depending upon the need, the background of the area, level of comprehension of children the intervention Programme for total development of school children was developed. The developed intervention Programme was child centered and child friendly, and were based on principles validated in the current context of developmental psychology and the rationales for selecting intervention programme were well studied on before using them.

11. The intervention adopted child-to-child approach and aimed at cognitive and psychosocial development of the children.

12. The intervention package consisted of child friendly play way methods of combination of art and craft work/games and play; word and vocabulary games; number games; cultural activities and other activities.

13. Programmers were adequately trained in delivering the intervention; some sessions were video recorded and was supervised by two clinical psychologists with frequent feedback.

14. Each activity was conducted on each day for one and half hours duration. The activities were repeated for six weeks spread across one and half months. Later the children and adolescents were allowed to carry on the programme, being
supervised by trained personal for next two months period. Overall the
intervention programme was delivered for three and half month’s period.

15. Study design included control group to control for the influence of developmental
maturation and expectancy effect.

16. Impact of intervention programme on development in terms of cognitive aspects
like attention, memory, intellectual functioning,; and psychosocial aspects like
self concept, adjustment, social problem solving ability were explored.

17. Ethical considerations were salient in the study. After the waitlist period, the
control group was provided the intervention programme.

Limitations:

1. Assessment of Deprivation index was not quantified rather considered only
qualitatively. Quantification could have been desirable.

2. Study had to be conducted on existing sample and randomization could not be
attempted.

3. Only 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> standard tribal school children were considered for the study.

4. The relatively small sample size and much smaller control group limits the
generalisability.

5. The sample size of control group was not equal to the sample size of
experimental group, as the teachers at some schools were not willing to have their
schools as waitlist control group; and even if attempted both the groups would
not have had the same sample size as the study was conducted on existing groups.

6. Mean scores baseline for two subscales of seventy one subscales for 4<sup>th</sup>, 5<sup>th</sup>, and
6<sup>th</sup> standard children were significantly different for experimental and control
group.

7. Assessment tools had certain limitations –
• Preadolescent Adjustment Scale (PAAS) lacked a quantitative indicator of the degree/intensity of adjustment problems and had a limited span of items in each domain.

• Group Social Problem Solving Assessment (GSPSA) had limited span of items in each domain and did not give total scores.

8. Teachers rating were considered for assessing on Children’s Behavior Questionnaire (CBQ). In many schools single teacher rated all the children. Though it was done with time gaps, it could have some limitations like unfamiliarity with the children, halo effect and leniency effect. Multiple informants such as teachers, parents and self-report could have been attempted for as it offer a more comprehensive picture of child.

9. Children were first generation literates attending school. Many children had problem in even writing their names hence changes were made in assessment tools, the way information was assessed and in the scoring pattern.

10. Though the intervention programme was specified. But some alterations had to be made depending on the level of comprehension of children, the language used and their background.

11. Follow up assessment was not attempted on. A long term follow up period and follow up data would have been more informative. Short-term benefits, however substantial, do not ensure long-term sustainability. Successful innovative programmes all over the world have been questioned and discarded on the question of sustainability and applicability.

12. Process analysis was not done due to time and financial constraints. Process analysis would have given a better picture as to how the intervention had a positive impact and it would have been useful to plan in other interventions for
different groups based on process analysis results (It was observed that it was probably not just the technique but also the way the intervention was provided and the role of the programmer played an important role).

13. Though adequate efforts were made to justify assessing cognitive and psychosocial aspects but had its limitations as it appeared to be a broader terminology.
SUGGESTIONS FOR FURTHER RESEARCH

A number of avenues for further research are suggested by the results of this study.

1. Large scale epidemiological research is needed to identify the prevalence of behavioral problems of psychological nature and psychological disturbances in both tribal and rural Indian school going children and adolescents. Methodological issues like representative sampling, two stag screening, multi-informant data, assessment of many other important cognitive and psycho social correlates need to be incorporated in future work.

2. Research with large sample is needed to establish the efficacy of the intervention programme. The identification of sub-groups who do not improve or those who require a long duration of intervention is also important.

3. Many of the assessment tools have been highly loaded on verbal ability, which pose as limitation to be used for tribal areas. Many children in such areas are first generation literates attending schools. Hence there is a need to keep these things in mind and standardise tools to this population, which can be taken up in future.

4. The present study has shown that there was a positive impact of child friendly, child-directed play way method on many cognitive and psychosocial aspects of development. Development of intervention programmes, evaluation and incorporation of such programmes at regular basis as school curriculum could be researched in future.

5. Studies on intervention programmes which require incorporation into the school curriculum have to be longitudinal studies to enable one to plan better use of the innovative methodology and compare the achievements of a group who have not been exposed to it.

6. Short-term benefits, however substantial, do not ensure long-term sustainability. Successful innovative programmes all over the world have been
questioned and discarded on the question of sustainability and applicability. Hence follow up assessment can be considered when evaluating such intervention programmes.

7. Along with the outcome evaluation it is important that process analysis is done which would have given a better picture as to how the intervention had a positive impact and it would be useful to plan in other interventions for different groups based on process analysis results. Such aspects can be taken up for further research.
IMPLICATIONS

These implications are outlined, based on the empirical evidence and observations made during the present study.

1. The tribals are in their transitory period where in they need to get adapted to the different type of life to that of the life they lead so far. The condition of the tribal area and schools have been discussed which would require different kinds of input from primary to that of the tertiary levels. The schools in such areas have to be involved to bring about cognitive and psychosocial development among children and adolescents.

2. The present study provides critical information that 5.6 per cent of school going tribal children have presented with behavioural problems of psychological nature and psychological disturbances. Initiatives have to be taken for early identification and primary and secondary prevention programmes need to reach out to a large proportion of vulnerable children (Durlak & Wells, 1998; Taylor & Adelman, 1996).

3. Many of the assessment tools have been highly loaded on verbal ability, which was difficult to be used with tribals. Many children in such areas are first generation literates attending schools and had never used many materials including colours, crayons etc. Assessment tools had to be modified to suit this group. Hence there is a need to keep these things in mind and standardise tools to this population also.

4. The base line scores and levels of the group on different assessment tools for 4th, 5th, and 6th standard tribal school children indicate that on many cognitive aspects these children are below average, and on many psychosocial aspects these
children showed limitations. It is necessary that early intervention programmes are delivered to such groups for cognitive and psychosocial development.

5. The tribal government schools are unlikely to be provided with costly infrastructure and educational facilities required to children and hence child friendly, play way methods can be used as intervention programmes.

6. The present study has shown that there was a positive impact of child friendly, child- directed play way method on many cognitive and psychosocial aspects of development. Hence such intervention programmes can be used for cognitive and psychosocial development of school going children in general and specifically the tribal children. Such methods can be used as intervention programmes or can also be made a part of the curriculum, so that it is practiced on regular basis.

7. The activities or games that children get involved should be appropriate to the age and the maturational age. Maturational age is when the previous experience of the child is taken into account, new games have to be introduced. Ethnic sensitivity to the promotion of indigenous cultures needs to be incorporated. Abstract activities such as life skills programmes could yield in better results in development of psychosocial aspects.

8. For regularising the programme there need not be a well trained individual, rather there is a need for individual who believes in child directed rather than adult directed learning. The programmers have to act as a catalyst and provide the time, space and the materials. All that the children need is some encouragement and supervision.

9. The present study has shown that children can be the resource for promotion of their own psychological development. Child friendly methods can be used in such areas where there is shortage of teachers and also that the teachers could
learn more from the children, as children think for themselves, work on their own and are more creative and imaginative than adults.

10. Teachers are expected to use child-friendly methods in teaching while very few teachers are themselves child-friendly. They choose to follow traditional instructional methods. Promotion of child development in the contemporary context of developmental psychology emphasizes approaches which are creative, flexible and child-centred. There is a need to disseminate the information that child-friendly, play way methods are efficient to bring about learning among children, very specifically to teachers and hence workshop for teachers are to be conducted to pass on information and written materials be distributed about the same. Also teachers need to be sensitized to crucial issues in normal child development. Teachers need to have some orientation to mental health and disabilities among children to care for them in better ways. Teachers need to know about identification of mental health problems and disabilities, its referral and management in terms of sensitivity, mainstreaming, follow-up and management.

11. The present study has shown that the intervention programme promotes cognitive (attention, memory and level of intellectual functioning) and psychosocial (self concept, adjustment and social problem solving ability) development of the children leading to better academic performance and healthier interpersonal relationships in the school setting. Hence interventions are very crucial in tribal schools.

12. In the present study many aspects of memory has improved after intervention programme but some complex aspects of memory like delayed logical memory, digit span backward and visual retentivity have had no impact indicating that the
intervention has not been able to tap these aspects of memory. It can be noticed that of the other areas these three areas are the complex aspects of memory which require components of long term retention and reconstruction of memory. Hence it is important to add some aspects to the intervention like games of retaining and manipulation so that these aspects can also be improved.

13. On Social Problem Solving Assessment there was small effect of intervention though there was of course a significant improvement in the experimental group after intervention. There is probably a need for using more specific activities like life skills training to bring about large effect of intervention programme, which again has to be researched upon for confirmation.

14. General qualitative analysis of the results have also shown that the the children who have scored less on both cognitive aspects have improved to a great extent after intervention programme where as children scoring higher on assessment tools have not improved much. This need to be analysed in depth and intervention programmes of this nature needs revisions, additions, and creation of complex activities to cater to the needs of children with different levels of performances.

15. The study has noticed that there has been general development of psychosocial aspects irrespective of addition of the intervention programme, but without intervention the development is slow where as introduction of intervention increases the pace of development. Even here some psychosocial aspects show drastic improvement than another aspect. A need for process evaluation of the intervention is needed to understand the issue which again needs further research in this area.
16. The efforts in the present study are laudable yet call for the further development and implications of programmes to promote cognitive and psychosocial development of Indian school children in general and tribal school children in specific.

17. Gender differences in some aspects of development are very evident. After intervention programme the gender difference reduce to insignificant level indicating that there could be social factors and environmental factors contributing to the development which can be reduced using intervention programmes which is a positive aspect.