

Impact of Child Friendly Play-Way Method of Intervention Programme on Enhancement of Attention among Tribal Children

Geetha. A^{1*}, Dr. Shivakumara. K²

ABSTRACT

Aim: The aim was to study the impact of child friendly play-way method of intervention programme on enhancement of attention among tribal children. **Sample:** The research was conducted in Ashrama Schools (schools run for tribal children). The sample consisted of tribal children studying in 4th, 5th and 6th standard, aged between 9 to 12 years. **Methodology:** A before – after, experimental control group design with post assessment after three and half months of intervention programme was adapted for the study. The intervention programme consisted of art and craft work; games and play; word games; number games and cultural activities. **Procedure:** Initially both the experimental and control groups were screened on Children's Behaviour Questionnaire and then were assessed (pre-assessment) on Number Cancellation Test/ Speed and Accuracy Test. The intervention programme consisting of art and craft work; games and play; word games; number games and cultural activities were conducted for a period of three and half months on experimental group. Again the experimental and control groups were assessed on Number Cancellation Test/ Speed and Accuracy Test. **Analysis of results:** Independent and Paired 't' analysis along with effect size analysis was adopted to find the difference between pre and post intervention programme and the impact of child friendly play-way method of intervention programme on enhancement of attention among tribal children. **Results and conclusions:** The experimental group has improved more than control group on attention after intervention programme, indicating effectiveness of the intervention programme on enhancing of attention.

Keywords: *Child friendly play-way method of Intervention Programme, enhancement of attention, and Tribal Children*

Attention is the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things. Attention has also been referred to as the allocation of processing

¹ Research Scholar, Department of Studies in Psychology, Karnatak University, Dharwad -03, Karnataka, India

² Associate Professor, Department of Studies in Psychology, Karnatak University, Dharwad-03, Karnataka, India

*Responding Author

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resources (Anderson, 2004). Attention describes the focusing of perceptive awareness on a particular stimulus or set of stimuli that result in the relative exclusion of other stimuli and is often accompanied by an increase in the readiness to receive and to respond to the stimulus or set of stimuli involved (Hans James, 1993).

Hierarchic model gives description of different types of attention as given below; The ability to respond discretely to specific visual, auditory or tactile stimuli can be called as focused attention; The ability to maintain a consistent behavioral response during continuous and repetitive activity is sustained attention (vigilance); The ability to maintain a behavioral or cognitive set in the face of distracting or competing stimuli is selective attention (Therefore it incorporates the notion of 'freedom from distractibility'); The ability of mental flexibility that allows individuals to shift their focus of attention and move between tasks having different cognitive requirements is alternating attention. Divided attention is the highest level of attention and it refers to the ability to respond simultaneously to multiple tasks or multiple task demands.

Attention is an important component of cognition without which even processing information, analysing, storing of information, learning could all be affected and hence very important aspect of human life. It is seen that environment in terms of stimulation and nutritional aspects also influence development of attention. Large number of studies in the United States that have shown that socioeconomic disadvantage and other risk factors that are associated with poverty (e.g., lower parental education and high family stress) have a negative effect on cognitive development including attention (Duncan, Brooks-Gunn & Klebanov, 1994; McLoyd, 1998).

The objective of the study conducted by Helen Baker, Jena, Syed and Sally (2009) was to determine whether undernourished children aged 6 –12 years had different temperament traits than better-nourished children. The results showed that the undernourished children were less sociable, less attentive, more fearful, and had more negative emotionality. The study by Qiu (2007) explored influence of socially disadvantaged families on hyperactivity-inattention of children between four and eleven years of age which showed that micro (child) and the macro (environmental) both had effects on children's attention.

The school environment is one of the primary contexts for cognitive development including attention. Schools have central position in many children's lives and potentially in their development, especially when families are unable to assume a leading role. But if schools do not take their roles adequately it could hamper the development of children in all aspects. Survey studies on physical conditions, enrolment rate, crowding, drop out, facilities given, wastage rate, teacher's level of training, attitude towards education, traditional teaching methods, etc about the rural and tribal schools were conducted by various researchers. Studies by Desai and Patel (1981) and Pratap, Raju and Rao (1971) did not project a good profile of ashram schools. Pratap

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and Raju (1973) found the working and physical conditions of ashram schools unsatisfactory. Some of the teachers working in these schools did not stay there and visited schools occasionally and in most of the ashram schools the number of children enrolled was much higher than the prescribed number. Such environments will not give a conducive environment for cognitive development including attention. And hence needs inputs for enhancement of attention among tribal children. It is seen that the methods to promote the psychosocial development are child centered, and are to be based on principles validated in the current context of developmental psychology (Kapur, 2007). So, if one needs to provide quality education, there should be shift of focus from teacher initiated instructional practices to improve academic skills to child initiated play-way methods, to promote development across all domains.

Saiz and Roman (1998) studied the effect of a cognitive training program on the problem-solving abilities of socially disadvantaged children. Experimental and control subjects were tested before, immediately after, and two months after the program to assess their levels of attention and comprehension and their information processing, reasoning style, problem-solving methods, and response elaboration. There was a significant difference on all the measures. These couple of studies do indicate that there is an impact of poverty and disadvantage on attention, but can also be enhanced through some methods. Hence in the present study was planned to use child friendly play way methods of intervention programme to enhance attention among tribal children.

METHODOLOGY

In this background the present research aimed to study the impact of child friendly play-way method of intervention programme on enhancement of attention among tribal children. The objective was to study the impact of child friendly play-way method of intervention programme on enhancement of attention among 4th, 5th and 6th standard tribal children aged between 9 to 12 years. A before – after, experimental control group design with post assessment after three and half months of child friendly play-way method of intervention programme was adapted for the study. It was hypothesised that there will be a significant enhancement in attention for children after intervention programme on experimental group; and that experimental group (with intervention) will be significantly better in attention than control (without intervention) group children. The research was conducted in Ashrama Schools (schools run for tribal children). The sample consisted of tribal children studying in 4th, 5th and 6th standard, aged between 9 to 12 years. Initially both the experimental and control groups were screened on Children's Behaviour Questionnaire and then were assessed (pre-assessment) on Number Cancellation Test/ Speed and Accuracy Test. The intervention programme consisting of art and craft work; games and play; word games; number games and cultural activities were conducted for a period of three and half months on experimental group. Again the experimental and control groups were assessed on Number Cancellation Test/ Speed and Accuracy Test. Appropriate statistical analysis was incorporated to find the difference between pre and post intervention programme and the impact

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of child friendly play-way method of intervention programme on enhancement of attention among tribal children.

Sample

As indicated in table 1 the sample of tribal children studying in 4th, 5th and 6th standard, aged between 9 to 12 years from different Ashrama schools were part of the study. The total number of students in the experimental group from 4th, 5th and 6th standard was 101, 93 and 60 respectively. The total number of students in the control group from 4th, 5th and 6th standard was 44, 38 and 39 respectively. The experimental group consisted of 254 students and the control group consisted of 121 students.

Table 1: Sample across class and gender for experimental and control group

No of students							
Age range	Class	Experimental group			Control group		
		Boys	Girls	Total	Boys	Girls	Total
9 -10 years	4 th std	50	51	101	24	20	44
10- 11 years	5 th std	46	47	93	16	22	38
11-12 years	6 th std	23	37	60	21	18	39
Total		119	135	254	61	60	121

Tools

- 1. Children's Behaviour Questionnaire (CBQ; Rutter, 1967):** The CBQ is in the form of a questionnaire, with descriptions of the student's classroom behaviour and academic achievement. Rutter's proforma B is screening instruments to be completed by teachers and deals with behavioural problems of psychological nature. It consists of 26 descriptions of behaviours 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. Rutter (1967) found that a cut off score of nine or more had a discriminative value. Rutter, Tizard and Whitmore (1970) found a cutoff score of nine or more had a discriminative value for identifying the disturbed children. 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, Tizard & Whitmore, 1970). The Children's Behavior Questionnaire (CBQ) was chosen for the study as screening tool 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. 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

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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/ Speed and Accuracy 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.

Analysis of results

Independent and Paired 't' analysis was adopted to find the difference between pre and post intervention programme of experimental and control group. Effect Size (ES; Cohen, 1977) estimated of intervention outcome on different assessment tools was calculated to study the impact of child friendly play-way method of intervention on enhancement of attention among tribal children.

RESULTS

Pre-intervention baseline assessment of attention on Number Cancellation Test/ Speed and Accuracy Test

Table 2: Pre-intervention (base line) average scores of students on Number Cancellation Test/ Speed and Accuracy Test

Test	Average score	SD
Single Digit Cancellation	23.55	10.09
Double Digit Cancellation	33.79	10.57

The present study assessed the attention and concentration by using Number Cancellation Test/ Speed and Accuracy Test which consisted of two types of task i.e. single digit cancellation task and double digit cancellation. The total number of correct digits cancelled, were counted (totalled). According to the NIMHANS Index of Specific Learning Disability Battery (Kapur, et al 1992) the normal range of number of correct digits that could be cancelled by 4th and 5th standard students was between 36 to 56 (4th standard) and 44 to 66 (5th standard). As indicated in table 2 in the present study the average number of correct digits that is cancelled by 4th, 5th and 6th standard tribal children is between 13.5 and 33.5 for single digit cancellation and between 23.22 and 43.36 for double digit cancellation, which is below the expected level indicating that the performance of the group is below average on Number Cancellation Test/ Speed and Accuracy Test.

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Comparison of the mean scores (baseline scores) of experimental and control group before intervention on Number Cancellation Test/ Speed and Accuracy Test

Table 3: Mean scores, standard deviation of experimental-control group and t values on sub tests of - Number Cancellation Test/ Speed and Accuracy Test Pre-intervention

Test	Group	N	Mean	S D	't' Value
Single Digit cancellation	Experimental	254	23.11	9.89	1.22
	Control	121	24.47	10.47	
Double Digit cancellation	Experimental	254	32.77	11.21	2.73*
	Control	121	35.93	8.74	
* P = .05 (significant at 0.05 level)					

Post-hoc analysis using independent 't' test on Number Cancellation Test/ Speed and Accuracy Test was done for experimental and control group prior to the intervention to establish the base line scores comparisons on different tests and to check for homogeneity between the experimental and control group. The table number 3 shows that on Number Cancellation Test/ Speed and Accuracy Test there was no significant difference between the means of experimental group and control group for single digit cancellation, but there was a significant difference between the experimental group and control group for double digit cancellation ($t = 2.73$; Significant $p < 0.05$). Control group was better on double digit cancellation than experimental group. Hence it could be concluded that there was homogeneity between the experimental and control group for single digit cancellation and not for double digit cancellation. But it can be seen that control group is significantly better in double digit cancellation and if experimental group gets significantly better scores on double digit cancellation it could be assumed that any difference on experimental group on these tests and subtests could be because of the intervention programme.

Comparison of the mean scores of experimental group and control group -before and after intervention on subtests of - Number Cancellation Test/ Speed and Accuracy Test

Table 4: Mean scores, standard deviation of experimental-control group and t values on sub tests of - Number Cancellation Test/ Speed and Accuracy Test before and after intervention

Test/Group	Experimental pre		Experimental post		(N=254)	Control pre		Control post		(N=121)
	Mean	SD	Mean	SD	't' value	Mean	SD	Mean	SD	't' value
Single	23.11	9.89	30.74	13.48	7.56**	24.47	10.47	25.05	9.85	2.29*
Double	32.77	11.21	44.1	18.06	8.51**	35.93	8.74	35.19	9.20	2.33*
** P = .01 (Significant at 0.01 level) * P = .05 (significant at 0.05 level)										

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As shown in table 4 on number cancellation test/ Speed and Accuracy Test, there was significant difference between the means of experimental pre-group and experimental post-group on the subtest of single digit cancellation ($t = 7.56$; Significant $p < 0.01$), and there was a significant difference between the means of experimental pre-group and experimental post-group for double digit cancellation ($t = 8.51$; Significant $p < 0.01$). On the same test there was significant difference between the means of control pre-group and control post-group for single digit cancellation ($t = 2.29$; Significant $p < 0.05$), and there was a significant difference between the control pre-group and control post-group for double digit cancellation ($t = 2.33$; Significant $p < 0.05$). For experimental group the significant difference is at 0.01 level, where as for the control group the significant difference is at 0.05 level, indicating that though both the groups have improved through time the experimental group has improved more than control group after intervention and shown higher consistency. And also it can be noted that the control group has significantly decreased in performance on test of double digit cancellation after a gap of three and half months which is of concern.

Post-intervention comparison of the experimental and control group on subtests of - Number Cancellation Test/ Speed and Accuracy Test

Table 5: Mean scores, standard deviation of experimental-control group and t values on sub tests of - Number Cancellation Test/ Speed and Accuracy Test after intervention

Test	Group	N	Mean	S D	't' value
Single Digit cancellation	Experimental	254	30.74	13.48	4.14**
	Control	121	25.05	9.85	
Double Digit cancellation	Experimental	254	44.1	18.06	5.12**
	Control	121	35.19	9.20	
** P = .01 (Significant at 0.01 level)					

As indicated in table 5 on Number Cancellation Test/ Speed and Accuracy Test there was significant difference between the means of experimental post-group and control post-group for single digit cancellation ($t = 4.14$; Significant $p < 0.01$), and there was a significant difference between the experimental post-group and control post-group for double digit cancellation ($t = 5.12$; Significant $p < 0.01$). On both the subtests the experimental group was significantly better than control group.

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Effect size estimates of intervention programme outcome

Table 6: Effect size estimates of intervention programme outcome on Number Cancellation Test/ Speed and Accuracy Test

Test	Group	Mean	S D	ES	ES(d)	Effect
Single Digit cancellation	Experimental	30.74	13.48	0.46	0.46	Small
	Control	25.05	9.85			
Double Digit cancellation	Experimental	44.10	18.06	0.57	0.56	Medium
	Control	35.19	9.20			

Effect size is the average amount of change in the standard deviation units achieved by the average individuals in the intervention group versus the change achieved by the average individuals of the control group. By convention, an effect size of 0.8 is considered as a large effect size. The table 6 shows the effect size estimates of intervention programme outcome on Number Cancellation Test/ Speed and Accuracy Test. The effect size for single digit cancellation and for double digit cancellation was of the small and medium range respectively. These scores indicate that the intervention had significant small and medium effect respectively on the simple and complex task of attention.

DISCUSSION

The present study assessed the attention and concentration of tribal school children studying in 4th, 5th and 6th standard by using Number Cancellation Test / Speed and Accuracy Test (Kapoor, 1974) which consisted of two types of task i.e. single digit cancellation task and double digit cancellation. 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 to twelve years). In the present study the total number of correct digits cancelled on both single digit cancellation and double digit cancellation was below the expected level indicating that the performance of the group was below average on Number Cancellation Test/ Speed and Accuracy Test.

The study by kapur and Uma (2003) on a rural sample of 800 children (8-12years) had below average performance on Number Cancellation Test/ Speed and Accuracy Test (Kapoor, 1974). None of the other studies were available to compare the performance of the children on this particular test in background of tribal children. Whereas some studies have used other methods to assess the attention by using Digit-Span Test which is a tool to assess attention and especially sensitive to deficits in attention, concentration, and alertness to the environment (Oommen, 1990). In a study conducted by Das (1992) the performance of the advantaged children was better than that of the disadvantaged children on Digit-Span (forward) and socially advantaged children performed significantly better than their socially disadvantaged counterparts on test of Digit-Span (backward). Attentiveness is also assessed as part of personality trait by some studies

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conducted on children. One such study by Helen Baker, Jena, Syed and Sally (2009) administered temperament questionnaire consisting of 7 subscales of which one subscale being attention. The results showed that the undernourished children were less attentive. Though not many studies were available with specific reference to the particular test used in the study and the sample of tribal children, studies have point out that for the tasks on attention the rural and tribal children have below average performance and there is a need for intervention methods to improve attention.

Attention controls flow of information processing and the concept of attention includes three important functions like selection, capacity and sustained concentration (Oommen, 1990). Some of the strategies to enhance attention includes stringing beads, matching – sorting, finger dexterity games, mazes, colouring and painting within the lines, jig saw puzzles, scanning pictures and numbers, listening to stories, tapping boards etc (Oommen In: Uma, Oommen and Kapur, 2002). Though in the present study the attention enhancing tasks were specifically not used, the intervention programme package consisted of a combination of art and craftwork, play, cultural activities, number, word-language games and life skills activities, which adopted a child-to-child approach. This intervention programme aimed at enhancement of level of attention.

On Number Cancellation Test/ Speed and Accuracy Test the 4th, 5th and 6th standard rural/ 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 pre-group and control post-group for single digit cancellation and double digit cancellation. It was noted that there was significant difference between the means of experimental post-group and control post-group for single digit cancellation, and double digit cancellation. The effect size indicated that the intervention had significant small and medium effect on single digit cancellation and double digit cancellation respectively which are the tasks of attention. Though both the experimental and control groups have improved through time the experimental group has improved more than control group after intervention, indicating effectiveness of the intervention programme on enhancing of attention.

The results of the group as a whole is according to the hypothesis stated that there will be a significant improvement in the single digit cancellation and double digit cancellation for children after intervention programme. And the results of the group is according to the hypothesis stated that experimental group (with intervention) will be a significantly better in the single digit and double digit cancellation than control (without intervention) group children and adolescents.

Some studies have used intervention techniques like giving in extra play time, child centered play therapy, reading mentoring and cognitive training program to enhance attention, which is one of the aspects under their study. It can be seen that some studies were very keen about

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tackling attention problem with ADHD (Ray, Schottelkorb & Tsai, 2007) and some others - 'attentiveness' as personality trait (Pellegrini & Davis, 1993) and others studies saw attention as associated cognitive issues with other major cognitive aspects like problem solving and information processing. In a study by Pellegrini and Davis (1993) which charted the behaviour of 14 boys and 9 girls (aged 9 years) in the classroom immediately preceding playtime on the playground for a period of 14 wks, results showed that play time improved attention to seat work. Ray, Schottelkorb and Tsai (2007) in an intervention study of child centered play therapy and reading mentoring on attention deficit hyperactive children showed that children who participated in either of the intervention conditions demonstrated statistically significant improvement on the ADHD Index of the Conners Teacher Rating Scale. Saiz and Roman (1998) involved socially disadvantaged children to study the effect of a cognitive training program on different aspects of the problem-solving abilities along with levels of attention. Results showed that there was a significant improved on all the measures, which also involved levels of attention that improved through cognitive training program.

In the present study attention was seen as the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things. Attention has also been referred to as the allocation of processing resources (Anderson, 2004). Russ (1998) points out that play is involved in the development of many cognitive, affective and personality process that are important for adaptive functioning and play is important to healthy brain development (Shonkoff & Phillips, 2000; Frost,1998; Tamis, Shannon, Cabrera and Lamb, 2004). Among the domains of development enhanced through games and play are reaction time and quick response which are components of attention. In the present study the experimental group has improved more than control group after intervention programme, indicating effectiveness of the intervention programme on enhancing of attention.

CONCLUSIONS

The present study assessed the attention and concentration of tribal children studying in 4th, 5th and 6th standard by using Number Cancellation Test/ Speed and Accuracy Test. The total number of correct digits cancelled on both single digit cancellation and double digit cancellation was below the expected level indicating that the performance of the group was below average on Number Cancellation Test/ Speed and Accuracy Test.

On number cancellation test/ Speed and Accuracy Test though both the experimental and control groups have improved through time, the experimental group has improved more than control group after intervention and shown higher consistency. And also it can be noted that the control group has significantly decreased in performance on test of double digit cancellation after a gap of three and half months which is of concern.

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For Number Cancellation Test/ Speed and Accuracy Test on both the subtests of single digit cancellation and double digit cancellation the experimental group (after intervention) was significantly better than control group.

The effect size indicated that the intervention had significant small and medium effect on single digit cancellation and double digit cancellation respectively which are the tasks of attention. This shows that the intervention programme's effectiveness on enhancing of attention.

The results of the group as a whole was according to the hypothesis stated that there will be a significant improvement in the single digit cancellation and double digit cancellation for children after intervention programme. And the results of the group was according to the hypothesis stated that experimental group (with intervention) will be a significantly better in the single digit and double digit cancellation than control (without intervention) group children and adolescents.

The present study tried using child friendly play-way method of intervention programme to enhance attention among tribal children studying in 4th, 5th and 6th standard. Impact of child friendly play-way method of intervention programme to enhance attention was to some extent positive and hence such intervention programmes can be used with children to enhance the attention capacities and hence indirectly help enhancing their cognitive aspects. Also it could be noted that the intervention programme was child friendly play-way method with is also cost effective, and hence such intervention programmes be implemented in the curriculum of the school activities for beneficial effects.

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