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EFFECTS OF STRUCTURED PHYSICAL ACTIVITY IN IMPROVING ATTENTION AMONG SCHOOL GOING CHILDREN

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ABSTRACT

Background of the study: Attention is the behavioural and cognitive process of selectively concentrating on a discrete aspect of information. Difficulty in maintaining attention in the classroom is the main factor for lower grades. However, as an emerging outlook in physiotherapy, engaging the underachievers in structured physical activity will enhance a attention skill. Consequently it will have a tremendous positive impact on children's academic performance. This study aimed to identify the effect of structured physical activity in improving attention skill among school-going children. **Methodology:** The study is an experimental study design and it was conducted among forty Children after obtaining ethical clearance and written consent from the school and parents of these children. All the children were selected based on the selection criteria. All the forty children were randomly allocated into two equal groups. The Children in Group A underwent structured physical activity for 60 minutes per day for three days a week for a period of five months. The children in Group B experienced relaxed indoor activities for 60 minutes and were given three days a week for five months. The pre and post therapy assessment was done using Mindful attention awareness scale (MASS) questionnaire. The SPSS statistical package 26.0 was used to analyze and compare the collected data. **Result:** The study result revealed a mean score of 31.68 ± 0.85 for Group A and 14.80 ± 0.87 for Group B with the p-value of 0.0001 which is highly significant. **Conclusion:** This study concludes that structured physical activity aids in improving the attention skill of school-going children which in turn improves the academic performance when compared with the children who underwent relaxed in door activities.

Keywords: Attention; MASS; Structured Physical Activity; Relaxed Indoor Activities.

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INTRODUCTION

Attention is the ability to choose and concentrate on relevant stimuli. It is the cognitive process that makes it possible to position ourselves towards relevant stimuli and consequently respond to it. This cognitive ability is very important and is an essential function in students' daily academic activities¹.

In recent pandemic situation there has been a shift in the lifestyles of various age groups including children especially school going children as there was a break in the regular classroom education system of study². Unlike children a few years ago children now a days are leading increasingly sedentary lifestyle that involves time spent on computer, Television and mobile gadgets.

Effective attention is what allows the children to screen out irrelevant stimulation in order to focus on the information that is important in the moment³. Difficulty with attention will lead to problems like not attending to a academic activity they miss details in instruction⁴. Children repeatedly make the same mistakes and unable to listen to all the information presented to them.

Prolonged sedentary behavior reduces the attention of the child and reduces the focus on the tasks⁵. Physical activity in early childhood helps preschoolers establish a healthy lifestyle⁶. Various educational objectives propose the physical activity on contribution in mental acuity, skills, and strategies essential for navigating challenges faced across the life span⁷.

Physical activity (PA) is any bodily movement produced by the muscles which require energy expenditures systematically and safely⁸. It also

includes the motor behaviors such as daily and leisure activities, and it is considered a determinant of life and for general health status⁹. Various studies identified that Physical activity facilitates the release of neurotrophic factors, which increases the blood flow to the cerebrum, thereby improving the supply of glucose and lipids to the brain^{11,12}.

The Mindful attention awareness scale is a 15-item scale designed to assess dispositional mindfulness. This scale strongly evaluates the psychometric properties which have been validated. It is unique to measure the consciousness related to predictive of a variety of self-regulation and well-being constructs¹³.

Various researches widely acknowledge the physical and mental health benefits of physical activity¹⁴, but there are fewer studies on their effects on cognitive and academic performances and few works were reported on this topic but not on the school children¹⁵, and there is much difference in the exercises prescribed by various researchers and Very few studies have been done in the area of physiotherapy on this perspective. So, this study is aimed to identify the effect of physical activity in improving attention among school-going children.

METHODOLOGY

The study was initiated after obtaining ethical approval from the Institutional ethical committee, Annamalai University, Tamil Nadu, India. A pamphlet was created about physical activity and approached the private schools in and around Komarapalayam, Namakkal district, Tamil Nadu. The researcher met the principal and explained the study and around 15 schools were visited only ten school principals agreed

to provide samples for the study. Written consent was obtained from the parent of the student who was included for the study prior to the beginning of the study. A meeting with the parent and the class teacher was made and explained the study. Only five schools were taken for this study, and 40 students were randomly selected from each school based on the inclusion criteria. The age group of the participants is 11 years to 14 years of both Genders.

The Children who had good attendance percentage and who were physically healthy with adaptive behavioral skills, were selected for the study. Children who are underachievers in their academic performance and children without any recent infections were also included for the study. Children with orthopedic or neurological disorders, those with injury to the lower limbs, severely obese children, children with psychological disorders, children who are already in sports were excluded from the study.

Forty-six children were selected for the study, and they all were divided randomly into two equal groups, twenty-three in each group. Group sampling was done by the computer-generated randomized method. The children in group A underwent structured physical activity for 60 minutes per day over a period of five month and three days per week. Structured physical activity (SPA) taught to the children includes walking with normal speed, walking with maximal speed, slow jogging, slow running, and skipping. Each exercise needs to be done for seven minutes^{16,17}.

Group B underwent relaxed indoor activities (RIA) for 60 minutes per day over a period of 5

months and three days per week. Fifteen minutes were given for warming up exercises, and cool down, activities were also provided. The intensity of the exercises was set at 50%-70% of maximal heart rate¹⁸.

A pre training data was collected using the MASS questionnaire. The post training data was collected by using the MASS Questionnaire at the end of the study (i.e., 5th month). The SPSS statistical package 26.0 was used to analyze and to compare the pre and post training on the impact of physical activity on the attention skill of school going children. The impact of physical activity on the attention skills was analyzed before giving the structured physical activity again the data was collected after 5 months. It was statistically analyzed using SPSS statistical package.

The parametric test was used to determine the level of attention using MASS score. The scores obtained pre-test and post-test values were compared. The obtained p value of 0.05 showed the significant difference between pre and post. Due to illness, three children were not able to attend the part of the study. As a result each groups both groups A and B from the study. As a result, each group had a total of 20 children.

RESULTS

A parametric test is used to analyze the data collected from the children and the data were analyzed using SPSS 26.0. The with-in group analysis is shown in Table II, and the between-group analysis in Table III. The demographical variables are shown in Table I. All of the analysis in the study was done using a critical value of $p=0.05$.

Age group	Number of participants	Male	Female
11 years	7	5	2
12 years	9	5	4
13 years	11	6	5
14 years	13	7	6
Total	40	23	17

Table 1: Shows that out of 40 children, 13 children were 14 years and 11 children were 13 years and 16 children were in between 11 to 12 years there were more number of male children than female children.

Food habits

Vegetarian	11	11.9 ± 0.837	13.33 ± 0.817
Non-Veg	29	12.88 ± 1.167	12.64 ± 1.12
Total	40		

While collecting the demographic detail which is not directly related to the physical activity. When we are taking about their food habits most of them having a habit of non vegetarian.

No of hours Sleeping

6—8 hrs	14	12.63 ± 1.30	12.67 ± 1.21
9—10 hrs	19	12.72.9 ± 1.10	13.0 ± 0.756
> 10hrs	7	12.5 ± 1.29	13.0 ± 1.73
Total	40		

In the same way sleeping hours of children was analysed were most of the children had their good sleep. Almost 19 students have 9-10 hours of sleep and 14 students have 6-8 hours of sleep.

No of hours Watching electronic Gadgets

2-4 hrs	10	11.33 ± 0.516	11.75 ± 0.957
4-6 hrs	19	12.82 ± 0.982	13.00 ± 0.926
6-8 hrs	11	13.67 ± 0.516	13.60 ± 0.548
Total	40		

Generally the children are watching electronics gadgets like mobile, laptop, Television for a period of 2-8 hours.

Table 2: Demographic and Variable analysis

Groups	Pre-test	S.D	Post-test	S.D	Paired 't' value	p value
Group A	44.15	1.76	71.15	3.39	31.68 ± 0.85	0.0394
Group B	44.30	1.66	57.15	3.09	14.80 ± 0.87	0.0437

Table 3: Suggests the data within the groups of pre and post test values of Group A and Group B on analysis of MASS

Groups	Post-test value	Effect size	Percentage of change	Unpaired 't' value	Cohen's d values	p value
Group A	71.15 ± 3.39	7.08	61.2%	13.63 ± 1.02	4.316	0.0001
Group B	57.15 ± 3.09	3.31	29%			

* The probability of this result, assuming the null hypothesis, is less than .0001.

Table 4: Showed the difference between Group A and Group B on analysis of MASS.

While comparing the pre-intervention and post-intervention data, there is a significant difference obtained between the groups. It was also noted there is a marked increase in attention skills of Group A students.

DISCUSSION

The purpose of the study was to identify the effects of structured physical activity in improving attention skill among school-going children. The problems of attention among the school going children are crucial in its

contribution towards learning and academic performances¹⁹. School children have trouble having proper attention due to anxiety, frustration, and depression. A prolonged sedentary lifestyle reduces the child's attention to academic instructions, concentration on the task engagements²⁰. So, it is mandatory to monitor these children and should give proper attention and training also needs to be given to them to overcome their difficulties²¹.

Physical activity (PA) is significant for a child to improve their fitness physically and mentally. It

aids in controlling the various psychological symptoms and reduces the risk of developing multiple health issues²². Exercises improve children's mental health by reducing anxiety, depression, and negative mood by improving self-esteem and cognitive functions²³.

Physical activity plays an essential role in improving the child's moods; the exercises increase circulation to the brain and influence the hypothalamic-pituitary-adrenal axis and reactive to stress²⁴.

Many Studies also identified that acute bouts of aerobic exercises increase cerebral oxygenated blood flow and improve precuneus' activity^{25,26}. The Physical activity also enhances Brain-Derived Neurotrophin Factors (BDNF) levels in the blood²⁷. This improves the activity of the brain and thereby improves the concentration, working memories, and visual-spatial abilities^{28,29}.

A few other studies also supported this study results; Tine and Butler have identified that 12 min single bout aerobic exercises improve attention and concentration in students with the age of 10-13 years³⁰.

A study conducted by Gallotta et al., 2012, identified that the school students involved in aerobic exercises in the physical education sessions showed an improved attention performance than those who didn't participate³¹. Above study is supporting the present study.

In a study, Meta-analysis of physical activity and cognitive performances in school-age children showed positive relationship. Several studies have suggested that participation in the

PA has a positive relationship with academic performances.

All these findings have suggested that physical activity has a strong influence on academic performances and improvement in the attention of school children. It also plays a significant role in the development of cognitive health.

This study showed a significant improvement in the attention skill of school children who underwent regular physical activity than those who were engaged in non-physical relaxed activity. The improvement in the relaxed activity group may be influence the participant in the research. There are considerable differences obtained within the groups. On comparing the groups, the group who underwent regular PA shows much significant improvement.

This study has identified a few limitations, as selecting the participants and making parents accept to be involved in the study was a monumental task. Home activity or recreational sports activities are not controlled.

As the study duration was higher many students hesitated to participate in the study initially and later, which was liked by them, COVID-19 rules were followed, but the investigation was concluded by using telephone calls to individual parents and direct visits to each child by the researchers.

Ethical Clearance: Ethical clearance has obtained from J.KK. Munirajah Medical Research Foundation, College of Physiotherapy, B. Komarapalayam, Tamil Nadu, to conduct this

study with reference number: 001/jkk copt dated 04/06/2019.

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Conflict of Interest: There is no conflict of interest to conduct or publish this study.

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CONCLUSION

This study concluded that structured physical activity is better in improving the attention of school-going children. When compare to the relaxed indoor activities.

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