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Effect of physical activity programme on selected variables of pre-school children

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Abstract

The study was aimed at examining the effect of physical activity programme intervention of eight weeks duration on BMI, flexibility and strength parameters of pre-schoolers. The study followed a randomised pre-post parallel group experimental design. 50 pre-schoolers in the age group of 5-6 years were randomly assigned to either Experimental (EG) or Control Group (CG). Intervention was given thrice in a week on non-consecutive days for eight weeks. Each session lasted for 5 minutes. Data pertaining to the selected variables were collected prior and post to the intervention. The results of the study revealed significant improvement on all the selected variables. It is concluded that eight weeks of physical activity programme improves BMI, flexibility and strength parameters of pre-schoolers.

Keywords: Physical Activity, pre-schoolers, BMI, flexibility

1. Introduction

Nowadays parents are over conscious and over concerned about the academics of their children. They believe that only education will benefit their children and physical activity has nothing to do with the future of a child. This is a wrong notion and many a times this hypokinetic lifestyle results in poor health status of children.

Many research studies concluded that year after year the growth and development of the children in India is being shunted. The possible reason may be this aversion to physical activity. According to World Health Organisation (WHO) Global Strategy on Diet, Physical Activity and Health report 2016 the number of obese children below five years of age is 41 billion. And almost half of them belongs to Asia. This report is a warning that physical activity culture in India, along with other Asian countries are at danger. Junk food and machine culture is leading our children into a life with drastic health issues. At present India is considered as the Diabetic capital of the world, and if this situation continues by 2020 India will become the Lifestyle diseases capital (WHO, 2013). This throws light on the need of preschool physical activity intervention.

Hence the researchers made an attempt to study the potential effects of physical activity on pre-school children.

2. Materials and methods

The study was aimed at examining the potential effects of structured physical activity programme on basic strength, flexibility and BMI of pre-schoolers. To achieve the objective of the study Randomised Parallel Group Pre-Post Experimental design was used. 50 pre-school children in the age of 5-6 years were selected as subjects. They were randomly divided equally into two groups i.e., Experimental Group (EG) and Control Group (CG). The parents of the subjects were oriented about the purpose and procedures of the study and informed consent was collected from them. Keeping in mind the basic physical qualities of children Body Mass Index (BMI), Flexibility, Upper Body Strength, Abdominal Strength and Trunk Extensor Strength were selected to be studied. BMI was calculated by using the formula viz. $BMI (Kg/M^2) = (Body\ Mass\ in\ Kg) / (Stature\ in\ M^2)$. Flexibility was measured by sit and reach test. 90^0 push up test was used to assess upper body strength. Curl up was used to assess abdominal strength. Trunk extensor strength was measured by Trunk lift test.

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Structured Physical Activity Intervention was given to Experimental group thrice in a week for eight weeks. Each session lasted for 45 minutes. The sessions started with a warm up and ended with a cool down phase. The control group received no structured physical education programme other than the regular school physical education activities. Data were collected one day before the start of the programme and after the completion of the programme. Descriptive

statistics like mean, standard deviation, minimum score and maximum score were calculated to understand the nature of spread of data. Analysis of Covariance (ANCOVA) was computed to find out the effect of training on the selected variables. Statistical Package for Social Sciences (SPSS) 21.0 version was used.

3. Results and Discussion

Table 1: Mean, Standard Deviation, Minimum and Maximum Scores of Selected Variables

Variables	Test	Minimum	Maximum	Mean	Std. Deviation
BMI	Pre	12.63	22.27	15.56	1.96
	Post	11.00	21.67	15.17	1.90
Flexibility	Pre	15.00	35.00	22.06	4.30
	Post	15.00	37.00	22.89	4.64
Upper Body Strength	Pre	2.00	12.00	7.48	2.29
	Post	2.00	13.00	8.50	2.40
Abdominal Strength	Pre	1.00	12.00	6.54	2.61
	Post	2.00	15.00	8.04	2.84
Trunk Extensor Strength	Pre	5.00	12.00	8.44	2.04
	Post	5.00	17.00	10.60	3.02

Table 1 illustrates the test wise descriptive statistics for the selected variables of the pre-schoolers. The descriptive data shows a difference in the mean score of all the variables. To

examine the significance of difference between pre and post test scores Analysis of Covariance was computed by considering the pre-test score as a covariate.

Table 2: Analysis of Covariance for the Post Test Scores of Selected Variables

Variables	Adjusted Post Test Means		Sources of Variance	Sum of Squares	DF	Mean Square	'F' ratio
	Experimental Group	Control Group					
BMI	14.64	15.71	Between	14.32	1	14.32	22.22*
			Within	30.29	47	0.64	
Flexibility	23.75	22.02	Between	31.16	1	31.16	14*
			Within	104.59	47	2.22	
Upper Body Strength	9.31	7.68	Between	33.24	1	33.24	63.29*
			Within	24.68	47	0.52	
Abdominal Strength	9.21	6.86	Between	68.81	1	68.81	120.33*
			Within	26.87	47	0.57	
Trunk Extensor Strength	12.76	8.44	Between	233.28	1	233.28	62.87*
			Within	174.36	47	3.71	

*F 0.05 (1, 47) = 4.03

Table 2 reveals that following the eight weeks of Physical Activity intervention there was a significant difference between the experimental and control group on all the selected variables. Since the F ratios were higher the critical

value, it may be concluded that eight weeks of Physical Activity Intervention significantly improved the BMI, Flexibility, Upper Body Strength, Abdominal Strength and Trunk Extensor Strength of pre-school children.

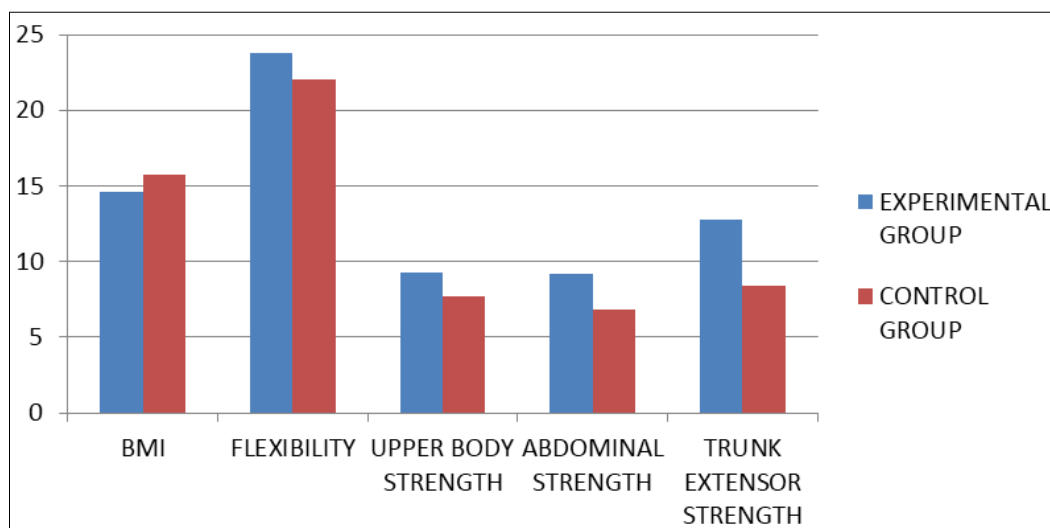


Fig 1: Difference between Experimental and Control Group on Adjusted Post Test Means

A reduction in the Body Mass Index reflects a reduction in the percentage body fat and an improvement in the lean body mass. In the present context children are vulnerable to obesity due to the consumption of junk foods. Physical activity intervention is a potential solution to child obesity. The basic motor fitness parameters like strength and flexibility are crucial in deciding the quality of life of the children. There is an inverse relationship between physical fitness and absenteeism in schools (D'Agostino *et al.*, 2018) ^[1]. The results of the present study is in agreement with results of the study conducted by Leppänen *et al.*, (2017) ^[4] i.e., moderate to vigorous physical activity improves strength parameters and improvement in Fat Free Mass Index. As a whole the study throws light on the importance of physical activity engagement in children for the proper growth and development and for laying the foundation of a physical activity culture.

4. Conclusions

After critically examining the changes to the selected variables following eight weeks of physical activity intervention and discussion of the findings the following conclusions are drawn:

- i. Eight weeks of physical activity intervention improved BMI, flexibility, upper body strength, abdominal strength and trunk extensor strength of pre-schoolers.
- ii. Eight weeks of interventions were enough to bring in an improvement for the selected variables of the pre-schoolers.

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