The Effect of Active Brain Breaks Programme on Attention of Elementary School children: a Pilot exploratory study

Ms. Shridevi Shridhar Jagdale
Chandrashekhar Agashe College of Physical Education, University of Pune, Pune, Maharashtra
Dr. Sheetal Laxman Shendkar
Amruteshwar arts commerce and Science College at Vinzar, Tal: Velhe, Dist.: Pune, Maharashtra

ABSTRACT

The purpose of this experimental research was to investigate the Active Brain Breaks Programme (ABBP) on Attention of Elementary School children age between 9-11 years. For this purpose, 40 children aged between 9-11 years, studying in PICT Model School Pune took part in the research study.

Active Brain Breaks program lasted for 2-3 minutes after 2-3 academic classes, so in a 1 day there are 3-4 activities are conducted, for 6 days in a week, for 4 weeks.

Children were selected as sample of the study using the non-probability based convenient sampling technique, The 40 children were divided in 20 control group and 20 experimental groups. The Rolf Brickenkamp (1981) D2 Test (Paper- pencil) of Attention was used to measure the attention of these children. After conducting 2-week program on experimental group and simultaneously 2-week daily activity of control group post test was conducted. The descriptive statistics show an increase in the mean performance of the experimental group from 7.65 (26.280) to 4.20 (24.802). In contrast, the control group showed a slight decline from -2.60 (17.410) to 3.70 (23.873). Inferential statistics using an independent samples t-test revealed that none of the differences were statistically significant, with the highest calculated t-value being 1.454 and a p-value above 0.05. it was concluded that there is no positive effect of 2-week Active Brain Breaks program on Attention of Elementary School children

Keywords : Active Brain Breaks, Attention

Introduction

Attention is a key cognitive function essential for learning and academic success. It enables individuals to focus on relevant information while filtering out distractions. According to Posner and Petersen (1990), attention plays a vital role in processing information, acquiring skills, and achieving academic excellence.

Elementary school students often struggle with maintaining attention due to increasing academic demands and digital distractions. Research indicates that attention deficits can negatively impact academic performance and contribute to behavioral challenges (Barkley, 2013). Given the importance of cognitive development in childhood, fostering attention early can provide a foundation for future academic and professional success (Anderson, 2002). Additionally, early interventions to enhance attention have been shown to yield long-term cognitive benefits (Shalev et al., 2011).

One approach to addressing these challenges is the Active Brain Breaks program, which integrates physical activity, mindfulness, and cognitive exercises to improve focus and reduce stress. This program can be seamlessly incorporated into school routines, offering structured movement breaks to counteract cognitive fatigue and enhance engagement.

While research supports the cognitive benefits of physical activity, findings on its direct impact on attention remain mixed. Some studies highlight improvements in executive function and neural connectivity (Hill, 2010), while others report non-significant effects (Donnelly et al., 2016; Van den Berg et al., 2019). Given these inconsistencies, this study aims to explore the impact of Active Brain Breaks on elementary school children's attention, contributing to the ongoing discussion on optimizing such interventions for educational settings.

Material and Methods

Variables : Based on the literature available on developing attention, various approaches were analysed by the researcher and a Active Brain Breaks program was identified as the independent variable and the attention was identified as the dependent variable.

Research Design : A Pre-Test Post-Test non-equivalent group design was adopted for this experimental study.

For this purpose, the subjects were divided into two groups. The experimental group, which underwent the experimental programme and the control group, which doing their regular activity. The attention of these groups were measured before and after the implementation of the programme.

Sampling : The population for this study will all the children aged between 9 yrs to 11yrs of the PICT MODEL School, Pune. 40 of these were selected as sample of the study using the non-probability-based convenience sampling technique. 20 of these children formed the experimental group and the remaining 20 formed the control group.

The convenience sampling technique was employed due to logistical constraints, including the packed academic schedule with back-to-back classes, limited time for the activity between classes, and the need to ensure student convenience, safety and willingness to participate in the program.

Procedure

Phase One : This experimental study targeted children aged 9-11 years. The researcher defined the population as students from PICT Model School within the specified age range. A sample of 40 children was selected for the study. Subsequently, the researcher developed the "Active Brain Breaks" program for children.

Phase Two : The 40 children were divided into two groups: an experimental group (n = 20) and a control group (n = 20). The attention of all 40 children was measured using the d2 Test of Attention. The experimental group underwent the researcher-designed "Active Brain Breaks" program, consisting of 2–3-minute sessions after every two academic periods, for six days a week, over a period of two weeks. In contrast, the control group continued with their regular activities. After the program, attention was measured again for both groups. The data was analysed to examine the change in performance between the experimental and control groups.

Results and Discussion

This study investigated the effectiveness of the Active Brain Breaks program on attention and cognitive efficiency in elementary school children. An independent samples t-test was used to compare performance between the experimental and control groups across four key measures: TN (Total Number), ChE1 (Cognitive Efficiency 1), ChE2 (Cognitive Efficiency 2), and ChCP (Cognitive Control and Processing).

Table 1 : *Comparative Analysis Of TN (Total Number) Different Groups*

Group Statistics					
Group		N	Mean	Std. Deviation	Std. Error Mean
ChTN	Experimental	20	7.65	26.280	5.876
	Control	20	-2.60	17.410	3.893

Independent Samples Test					
		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
ChTN	Equal variances assumed	1.454	38	0.154	10.250
	Equal variances not assumed	1.454	32.983	0.155	10.250

*Not Significant at 0.05 level of significance

The experimental group had a higher TN score (M = 7.65) compared to the control group (M = -2.60), suggesting potential benefits of the intervention.

However, the difference was not statistically significant (t = 1.454, p = 0.154), meaning the observed increase could be due to chance.

Table 2 : *Comparative Analysis Of E1 (Cognitive Efficiency) Different Groups*

Group Statistics					
Group		N	Mean	Std. Deviation	Std. Error Mean
ChE1	Experimental	20	-2.55	6.886	1.540
	Control	20	-0.65	3.483	0.779

Independent Samples Test					
		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
ChE1	Equal variances assumed	-1.101	38	0.278	-1.900
	Equal variances not assumed	-1.101	28.126	0.280	-1.900

*Not Significant at 0.05 level of significance

The experimental group had a lower mean score (-2.55) than the control group (-0.65), indicating no improvement in attentional accuracy.

The difference was not statistically significant (t = -1.101, p = 0.278).

Table 3 : *Comparative Analysis Of E2 (Cognitive Efficiency) Different Groups*

Group Statistics					
Group		N	Mean	Std. Deviation	Std. Error Mean
ChE2	Experimental	20	-2.75	6.656	1.488
	Control	20	-0.05	3.000	0.671

Independent Samples Test					
		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
ChE2	Equal variances assumed	-1.654	38	0.106	-2.700
	Equal variances not assumed	-1.654	26.412	0.110	-2.700

*Not Significant at 0.05 level of significance

The mean ChE2 score was lower in the experimental group (-2.75) than in the control group (-0.05), suggesting a possible decline.

The difference was not statistically significant (t = -1.654, p = 0.106).

Table 4 : *Comparative Analysis Of CP (Cognitive Efficiency) Different Groups*

Group Statistics					
Group		N	Mean	Std. Deviation	Std. Error Mean
ChCP	Experimental	20	4.20	24.802	5.546
	Control	20	3.70	23.873	5.338

Independent Samples Test					
		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
ChCP	Equal variances assumed	0.065	38	0.949	0.500
	Equal variances not assumed	0.065	37.945	0.949	0.500

*Not Significant at 0.05 level of significance

The experimental group had a slightly higher mean ChCP score (4.20) compared to the control group (3.70), but the difference was minimal.

The difference was not statistically significant (t = 0.065, p = 0.949).

Previous research on similar interventions has also found mixed or non-significant results. For instance, studies by Donnelly et al. (2016) and Van den Berg et al. (2019) reported that while short physical activity breaks improved student engagement, they did not consistently lead to measurable improvements in attention scores. One possible explanation for these findings is the duration of the intervention—many cognitive benefits require prolonged exposure to structured activities rather than brief, intermittent sessions.

Additionally, Mullender-Wijnsma et al. (2015) found that the effects of classroom-based physical activity interventions varied depending on the intensity of movement and the cognitive demand of the tasks. This suggests that the Active Brain Breaks program may need to incorporate more structured cognitive tasks alongside movement to yield more significant benefits.

Conclusion

This study aimed to assess the impact of the Active Brain Breaks program on attention among elementary school children. The findings revealed that while the experimental group showed slight improvements in certain attention measures, the differences between the experimental and control groups were not statistically significant. These results align with previous research that found mixed or limited effects of short-duration physical activity interventions on cognitive performance (Donnelly et al., 2016; Van den Berg et al., 2019).

The contribution of this study lies in its exploration of classroom-based movement breaks as a potential strategy for enhancing attention. While the results do not provide strong evidence for immediate cognitive benefits, they highlight the importance of intervention duration, activity intensity, and individual differences in determining effectiveness. These findings suggest that future research should focus on optimizing Active Brain Breaks by increasing the intervention length, incorporating cognitive engagement, and using a larger sample size.

From an educational perspective, this study underscores the potential of integrating short movement breaks into school routines to maintain student engagement and reduce cognitive fatigue. Even though the effects on attention were not statistically significant, Active Brain Breaks may still contribute to classroom dynamics by promoting active learning and reducing inattentiveness. Future studies should explore long-term implementations and their broader academic implications.

In conclusion, while this study did not establish significant cognitive improvements, it contributes to the ongoing discussion on the role of physical activity in education and provides a foundation for future research aimed at refining intervention strategies for enhanced student attention and learning outcomes.

References

Anderson, P. (2002). Assessment and development of executive function (EF) during childhood. Child Neuropsychology, 8(2), 71-82. https://doi.org/10.1076/chin.8.2.71.8724

Barkley, R. A. (2013). Executive functions: What they are, how they work, and why they evolved. Guilford Press.

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., ... & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. Medicine & Science in Sports & Exercise, 48(6), 1197-1222. https://doi.org/10.1249/MSS.0000000000000901

Hill, L. J. (2010). The impact of physical activity on cognitive function in children: A review. Journal of Science and Medicine in Sport, 13(3), 221-226. https://doi.org/10.1016/j.jsams.2009.04.007

Posner, M. I., & Petersen, S. E. (1990). The attention system of the human brain. Annual Review of Neuroscience, 13(1), 25-42. https://doi.org/10.1146/annurev.ne.13.030190.000325

Shalev, L., Tsal, Y., Mevorach, C., Makris, M., & Lavidor, M. (2011). Computerized progressive attentional training (CPAT) program: Effective direct intervention for children with ADHD. Child Neuropsychology, 17(1), 1-25. https://doi.org/10.1080/09297049.2010.515591

Van den Berg, V., Saliasi, E., Jolles, J., de Groot, R. H. M., Chinapaw, M. J. M., & Singh, A. S. (2019). Physical activity in the school setting: Cognitive performance and academic achievement—a systematic review. Journal of Science and Medicine in Sport, 22(1), 9-17. https://doi.org/10.1016/j.jsams.2018.09.013