



ENHANCING EMOTIONAL CONTROL AND TASK INITIATION THROUGH ADAPTED PHYSICAL ACTIVITIES AMONG STUDENTS WITH VISUAL IMPAIRMENT

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Article DOI: <https://doi.org/10.36713/epra23498>

DOI No: 10.36713/epra23498

ABSTRACT

Executive functioning encompasses a collection of interrelated higher-order cognitive skills that influence emotional, motivational, and social competencies. These functions are not solely limited to cognitive processes but also include aspects related to emotional responses and behavioral regulation (Gioia et al., 2000). Numerous studies highlight the limited socio-emotional development observed among students with visual impairment. Evidence suggests that executive functioning skills, such as emotional control and task initiation, can be enhanced through targeted physical activity training, promoting psychosocial growth in children. The present study investigates the impact of adapted physical activities on specific executive functioning skills namely emotional control and task initiation in students with visual impairment. A total of 420 students with visual impairment, aged 10 to 17 years, were selected using purposive sampling from special schools across selected districts of Tamil Nadu. The researchers developed a rating scale to assess the executive functioning skills of these students. An eight-week intervention program featuring a training package on Adapted Physical Activities was implemented with the experimental group. Pre and post-tests were conducted using the rating scale. Statistical analysis, employing t-tests, indicated that adapted physical activities significantly improved emotional control and task initiation skills in students with visual impairment.

KEYWORDS: Adapted physical activity, Students with visual impairment, Executive functioning skills, Emotional control, and Task initiation

1. INTRODUCTION

Executive Functioning (EF) skills are recognized as vital for the physical and mental well-being of children. Barkley (2011) describes EF as a set of self-regulated actions to influence a future outcome. These skills encompass decision-making, action planning, and generating appropriate motor responses to meet environmental demands (Reynolds and Horton, 2006). Emotional control, a key component of EF, refers to the ability to regulate emotions effectively. This involves recognizing suitable emotional responses and adjusting behavior to align with situational demands, regardless of internal emotional states. In contrast, task initiation is the capability to begin tasks or projects promptly and efficiently.

Research has consistently shown that children with disabilities exhibit reduced EF abilities. Yet, how vision and its absence affect EF development in early years has not been thoroughly investigated. Core EF processes such as initiative, attention orienting, inhibition, planning, and performance monitoring are frequently assessed using visual tasks (Bathelt, Haan, Salt & Dale, 2018). Children with visual impairment often face challenges with executive functioning, including difficulties in planning, organization, task initiation, and completion. Such deficits can significantly affect their academic performance and ability to manage daily tasks independently.

The limitations in visual acuity experienced by children with visual impairment hinder their ability to acquire skills necessary for adaptive behavior and EF across various contexts (Heyl & Hintermair, 2015; Bathelt et al., 2016; Keil, Fielder & Sargent, 2017; Bathelt et al., 2019). Many visually impaired students exhibit underdeveloped EF domains critical for socio-emotional growth (Heyl & Hintermair, 2015). This highlights the importance of targeted educational approaches that emphasize competencies like attention shifting and emotional understanding, particularly in inclusive settings (Heyl & Hintermair, 2015).

Adapted Physical Activity (APA) refers to tailored physical activities designed for individuals who face challenges in participating in standard programs. These adaptations address specific needs arising from conditions such as illness, injury, reduced functional capacity, or social circumstances. Modifications to the activities, instructions, equipment, and spaces enable visually impaired individuals to actively engage in physical activities with enthusiasm. Such participation not only fosters self-confidence but also enhances their overall health and fitness.

1.1 Need of the study

Sighted children typically engage in physical activities and are benefitted mentally, socially, emotionally, physically, and



academically. But the children with visual impairment face many challenges that hinder their participation in physical activities, thus resulting into lack of social interaction skills. APA is gaining its momentum in this era of inclusion. These activities are necessary for children with visual impairment as it improves self-satisfaction, self-confidence and self-reliance. (Parween et.al 2024). A study done by Ranjeeta (2021) discovered that the student's EF and physical health had improved as a result of their yoga practice. There are research studies done in the area of impact of physical activities on EF for typically developing individuals. There is dearth of studies on this area with reference to visually impaired population. Very few studies were found which is based on the effect of APA on EF of the visually impaired. The current inquiry seeks to explore the influence of APA on EF abilities, specifically emotional control and task initiation among students with visual impairment (SwVI). It aims to comprehend how specially designed physical activity training program can improve the EF of the individuals thus paving the way to the overall well-being of visually impaired individuals. The below-mentioned objectives were framed based on the needs of the study.

1.2 Objectives

1. To develop a research tool on EF Skills (Emotional Control and Task Initiation) for SwVI.
2. To develop and execute a training program using APA specifically designed for SwVI.
3. To assess the effectiveness of APA in enhancing emotional control skill and task initiation among the Control Group (CG) and Experimental Group (EG) of SwVI.

1.3 Hypotheses

1. There is a notable variation exists between the pre-intervention test and post-intervention test scores for emotional control in the EG.
2. There is a notable variation exists between the pre-intervention test and post-intervention test scores for task initiation in the EG.
3. There is no notable variation exists between the pre-intervention test and post-intervention test scores for emotional control in the CG.
4. There is no notable variation exists between the pre-

intervention test and post-intervention test scores for task initiation in the CG.

5. There is a notable variation between the post-intervention test scores of the EG and CG on emotional control.
6. There is a notable variation between the post-intervention test scores of the EG and CG on task initiation.

2. METHODOLOGY

2.1 Selection of subjects

A total of 420 SwVI, aged 10 to 17 years, were selected from special schools across chosen districts in Tamil Nadu using a purposive sampling method. 210 SwVI were assigned to both the EG and the CG each.

2.2 Selection of Variables

Independent Variable - Adapted Physical Activity
Dependent Variable - Emotional Control and Task Initiation

2.3 Research tool

Researchers devised a five-point scale for evaluating emotional control and task initiation in SwVI. The scale's responses consist of always, often, sometimes, rarely, and never. The tool was translated into Tamil, the regional language of Tamil Nadu.

2.4 Research design

The study followed an experimental design with initial and final test assessments. The EG participated in an eight-week APA training program, while the CG did not receive any training. Prior to conducting the study, the Heads of the schools were briefed on the study's objectives and nature, and their approval was obtained. Consent to participate was secured from all individuals involved before any data were gathered.

2.5 Reviewing the distribution type of the collected data

Examining the data's distribution is a crucial preliminary step prior to conducting a statistical analysis. It helps determine whether the dependent variables meet the assumptions of normality. In this study, measures of skewness and kurtosis were utilized to evaluate the normality of the data.

Table - I
Summary of Skewness and Kurtosis for Normality

Variable	Group	Test	Skewness	Kurtosis
Emotional Control	EG	Pre	-0.28	-0.85
		Post	-0.08	-0.98
	CG	Pre	-0.32	-0.79
		Post	-0.36	-0.72
Task Initiation	EG	Pre	0.00	-0.22
		Post	0.47	0.06
	CG	Pre	0.04	-0.25
		Post	0.04	-0.19

Since all skewness and kurtosis values lie within the range of -1 to +1 for both variables, it can be concluded that the data are normally distributed

2.6 Data analysis

The hypothesized relationships were tested using the 'Dependent t-test' and 'Independent t-test' or 'Welch's t-test' analyses.



3. ANALYSIS

Table – II
Within-Group Changes in Executive Functions Analysed Using Dependent t-Test

Variable	Group	Pre-Test Mean	Post-Test Mean	Mean Difference	T-value	P-value	Effect size
Emotional Control	EG	18.49	20.14	1.65	5.25	<0.01**	0.36
	CG	18.50	18.53	0.03	0.06	0.94	0.00
Task Initiation	EG	12.16	16.96	4.80	14.69	<0.01**	1.01
	CG	12.19	12.23	0.04	0.14	0.88	0.00

Note: ** P<0.01

For Emotional Control, the EG exhibited a clear improvement, with scores rising from a pre-intervention test average of 18.49 to a post-intervention test average of 20.14, an average increase of 1.65. Statistical analysis ($t = 5.25, p < 0.01$) and the effect size (Cohen's $d = 0.36$) suggest a small impact of the intervention. On the other hand, the CG displayed virtually no change, with an average shift of just 0.03 ($t = 0.06, p = 0.94$), and no measurable effect (Cohen's $d = 0.00$).

In the case of Task Initiation, the EG showed a marked improvement, moving from a pre-test average of 12.16 to a post-test average of 16.96, an average increase of 4.80. The statistical outcome ($t = 14.69, p < 0.01$) and a large effect size (Cohen's $d = 1.01$) indicate that the intervention had a strong influence on enhancing this skill. Meanwhile, the CG's performance remained largely unchanged ($t = 0.04, p = 0.88$), with no practical effect observed (Cohen's $d = 0.00$).

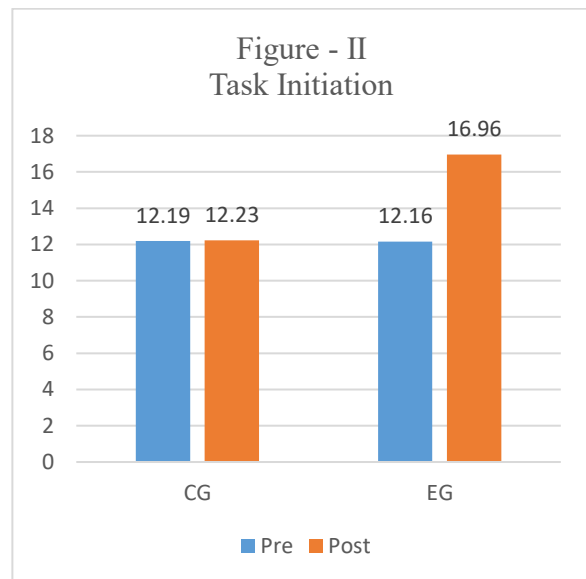
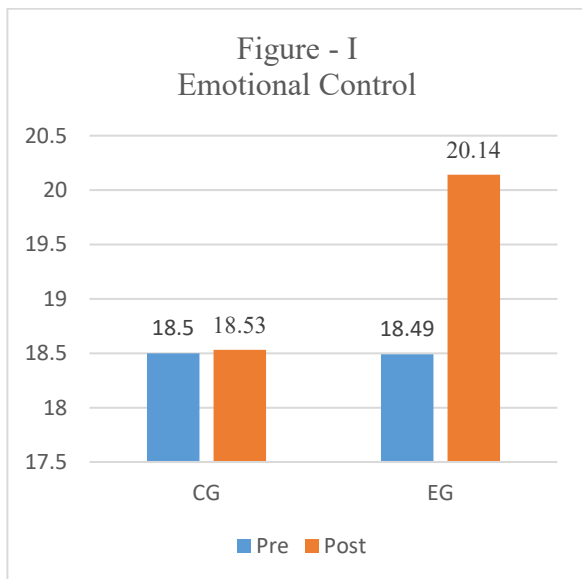


Table - III
Post-Intervention Outcome Evaluation Using Between-Group Analysis

Variable	Groups	Mean Difference	Levene's Test P-value	T-value	P-value
Emotional Control	EG	1.60	0.03	4.92	<0.01**
	CG				
Task Initiation	EG	4.73	0.90	15.08	<0.01**
	CG				

Note: ** P<0.01

For Emotional Control, the mean gap between the groups was 1.60. Levene's Test for equality of variances produced a p-value of 0.03, showing a variation in group dispersions. Nonetheless, Welch's t-test yielded a t-value of 4.92 and a p-value below 0.01, suggesting that the intervention positively influenced emotional control in the experimental group.

Regarding Task Initiation, the average score gap was 4.73. Levene's Test returned a p-value of 0.90, indicating that the variability in scores across the groups was comparable. The independent t-test produced a value of 15.08 with a p-value

under 0.01, pointing to a notable improvement in task initiation among participants who received the intervention.

4. DISCUSSION

The research set out to evaluate the influence of APA in enhancing emotional control and task initiation among SwVI. The intervention was implemented among a large sample divided into the EG and CG, with both groups undergoing initial and final assessments. The dependent t-test results demonstrated a clear improvement in EF domains for the EG. Specifically, participants who engaged in the APA program



showed notable gains in both emotional regulation and the ability to initiate tasks, suggesting a positive impact of structured movement-based interventions. The improvement in emotional control may be attributed to the structured, predictable, and engaging nature of the adapted activities, which likely helped students manage frustration, anxiety, and impulsivity more effectively. Regular participation in such programs might have fostered emotional awareness, resilience, and self-monitoring abilities. Similarly, the significant enhancement in task initiation implies improved motivation, attention regulation, and a stronger sense of purpose and autonomy in completing tasks. Movement-based learning strategies often promote cognitive activation, helping SwVI initiate actions with more confidence and focus.

In contrast, the CG did not show any meaningful change, which reinforces the potential of APA in stimulating EF where visual input is limited. The structured physical routines likely provided alternative sensory feedback, reinforcing behavioral patterns associated with executive control. And also significant differences were observed in both variables, confirming the intervention's role in enhancing cognitive-emotional functioning.

The APA sessions likely promoted the development of routine, self-regulation, and self-discipline, all critical components for emotional stability and task management. Additionally, such activities may have supported neurocognitive processing through kinesthetic and proprioceptive stimulation, compensating for the lack of visual cues. The findings align with prior research indicating the benefits of movement-based interventions for individuals with disabilities. These findings add momentum to ongoing research efforts that physical activity is not only essential for physical health but also a strategic approach for executive and mood-related development in visually impaired populations.

Educators and special educators should consider incorporating regular APA sessions into daily routines. These findings advocate for a holistic approach in special education, where physical activity is aligned with psychological and cognitive goals. Given the unique sensory needs of visually impaired students, movement-based interventions serve not just as physical engagement but as structured learning experiences that enhance self-regulation and planning.

5. CONCLUSION

This study confirms the effectiveness of APA in enhancing emotional control and task initiation among SwVI. The intervention successfully stimulated key aspects of EF, reinforcing the role of physical engagement in cognitive-emotional development. Students who participated in the program displayed stronger emotional regulation, suggesting improved coping mechanisms and self-monitoring skills. Likewise, improved task initiation reflects enhanced focus, motivation, and behavioral readiness to act. The findings highlight the value of integrating movement-based learning in special education settings, especially for populations with limited visual input. Adapted physical activities appear to activate compensatory sensory systems that support executive

control. This research encourages educators to move beyond traditional academic instruction and embrace kinesthetic learning approaches. It also provides a practical framework for inclusive teaching strategies. By fostering emotional and cognitive readiness through physical activity, schools can help visually impaired students reach their full potential both academically and personally. The intervention proves to be an effective, non-invasive, and scalable strategy. Overall, APA serves not only physical wellness but also acts as a catalyst for emotional balance and independent action among visually impaired learners.

Acknowledgment

The authors express their gratitude for the financial assistance provided by the Indian Council of Social Science Research (ICSSR), New Delhi. This article is a result of the Major Research Project on "Effectiveness of Adapted Physical Activities on the Executive Functioning of Students with Visual Impairment" under the domain of Social Psychology (F.No: 02/175/2022-23/ICSSR/RP/MJ) sponsored by ICSSR.

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