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Impact of folk games on physical fitness in children with special needs: An analytical study

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Abstract

Play and games are amusing and fun particularly in the paediatrics population provided with abundant health benefits. Traditional Indian games (also known as folk games) are played informally with minimal equipment and are documented with multifarious health benefits. Due to the ease of acquisition, low costs, widespread acceptability and culturally ingrained, the incorporation of these folk games into the physical education curriculum, may increase their physical activity along with parallel benefits of reviving the traditional Indian culture before they are lost forever. Despite these games being provided with numerous health benefits, their effect on physical activity for children with special needs is not yet determined. Hence this study process on the effect on folk games on physical activity

Methodology: Forty-seven participants fulfilling the inclusion criteria were included in the study. Adapted physical education protocols were given to the children based on their needs for 6 months duration, pre and post evaluation was done using the Brockport physical fitness test and results were analysed

Result: The data was none normally distributed. Hence, Wilcoxon signed rank test was performed to compare the mean difference before and after intervention. The difference in skinfold, hand grip, seated push ups, and modified apley's test were significant before and after treatment

Conclusion: There is a significant change in Physical activity level using Adapted physical education programme using Traditional Indian folk games.

Keywords: Traditional Indian folk games, adapted physical education, cerebral palsy, brockport physical fitness test, physical activity

1. Introduction

India has a diverse cultural heritage, with a wealth of indigenous folk games that are culturally ingrained. Due to the ease of acquisition, low costs, and widespread acceptability, this form of games can be incorporated to facilitate and improve physical fitness among children with neurodevelopmental disabilities [1]. Games are believed to provide engagement and enjoyment to encourage repeat gameplay, to facilitate making choices, risky or otherwise, without immediate personal consequences, and to embed behaviour change procedures needed to make individual positive health changes [2]. The benefits of physical activity are universal for all children, including those with disabilities. The participation of children with disabilities in sports and recreational activities promotes inclusion, minimizes deconditioning, optimizes physical functioning, and enhances overall well-being. Despite these benefits, children with disabilities are more restricted in their participation, have lower levels of fitness, and have higher levels of obesity than their peers without disabilities [3].

Games demonstrate entertainment and commercial potential, but also can be used for "learning by doing" activities providing instructional guidelines, problem solving challenges or practical tests of individual skills [4]. Children with disabilities may face a variety of medical procedures during their young lives and may be particularly susceptible to feelings of inadequacy, low self-esteem, and incompetence as well as feelings of anxiety, and lack of control associated with intense medical needs and demands [5]. Play and games are amusing and fun particularly in the paediatric population with abundant health benefits. Traditional Indian games are played informally with minimal equipment and are documented with multifarious health benefits. Due to the ease of acquisition, low costs, widespread acceptability and culturally ingrained, the incorporation of these folk games into the physical education curriculum, may increase their

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2. Materials and Methods

2.1 Trial design

The aim of the study was to evaluate the impact of traditional Indian folk games on physical activity (PA) in children with cerebral palsy. The study was conducted in various Sarva Shiksha Abhiyan (SSA) zones in Mysore from March 2020 to April 2022. The current study evaluated the impact of Adapted traditional Indian folk games protocol (duration of 6 months) in children with cerebral palsy.

2.2 Listing of traditional Indian folk games

Commonly played traditional Indian folk games in southern part of India were listed by method of Meta-ethnography, the process of listing includes the following process

- Collection of books, journals, articles which is highlighted with commonly played traditional Indian folk games in southern parts of India.
- Expert opinion from professionals in the field of folk games (with experience of at least 5 years), physical education department professionals and author's of various books on 'folklore'.
- Consensus has been obtained for listing the folk games enlightened with health benefits that enhance physical activity in children with cerebral palsy. Experts were 2 paediatric physiotherapists dealing with Rehabilitation of Neurodevelopmental disability. 1 expert from Paralympics and 2 from cultural heritage of southern India

Initially a list of 91 games were obtained based on the nature and feasibility in children with cerebral palsy 31 games were shortlisted. Later the 31 games were listed through the method of Meta-ethnography for this study intervention.

2.3 Biomechanical analysis

Biomechanical analysis of the listed 31 games were done through the framework given below using the kinovea software.

- Video documentation was done on professional players
- Biomechanical analysis were done for all the 31 games. The games were analysed separately for the gross motor function and hand function

2.4 Recruitment

Screening camps were conducted in various zones of SSA, viz Mysore north SSA zone, Mysore rural SSA, T Narasipura SSA and KR Pura SSA,

Zone	No. of samples
Mysore north SSA	19
Mysore rural SSA	17
T Narasipura SSA	8
KR pura SSA	3

Principal investigator did the baseline evaluation using Brockport Physical Fitness Test (BPFT) and ruled out the components that hinders the PA in children with cerebral palsy.

2.5 Adapted physical education programme

The Institutional Ethical Committee of JSS Medical College has approved the study on 31/10/19. 47 children who were fulfilling the inclusion and exclusion criteria were recruited for the study

2.5.1 Inclusion criteria

- Children with special needs of GMFCS, CFCS and MACS level 1 and 2.
- Children who obey verbal commands.

2.5.2 Exclusion criteria

- Severe behavioural abnormality as reported by parents and teachers.
- Children who have undergone any medical procedure that may preclude physical exertion.
- Seizures uncontrolled by medications.

2.5.3 Outcome Measures

Brockport Physical Fitness Test

2.6 Pre-test evaluation

Feasible components of Brockport Physical Fitness Test were performed on the children to assess their initial level of physical activity. The components are as follows

2.6.1 Body composition

- Height:** Measured using a stadiometer with precision of 0.1cm
- Weight:** Measured using a weighing scale with precision 0.1kg
- BMI:** Calculated by taking a person's weight and dividing by their height squared
- Skin fold:** callipers are used to measure the thickness of the skin at the triceps and subscapular site

2.6.2 Musculoskeletal Functioning, Muscular Strength/Endurance

- Hand grip:** Modification has been done to evaluation the hand grip strength. The pressure gradients in the sphygmomanometer are used to evaluate the hand grip
- Seated push up:** Child is instructed to extend the arms and raise the body out of a chair, and hold in that position as long as possible
- Modified curl up:** Child is instructed to complete up to 75 curl-ups at a rate of 1 every 3 seconds. The hands slide 4.5 inches along the ground for a complete repetition
- Reverse Curl:** is a measure of hand, wrist, and arm strength. While sitting in a chair, the subject must perform one repetition of bringing a 11b (0.5kg) dumbbell from the thigh to the flexed-arm position, holding it there for 2 seconds, then returning it to the thigh in a controlled manner

2.6.3 Musculoskeletal functioning (flexibility)

Modified apleys test- attempt to reach overhead with one hand and touch the top of the opposite shoulder blade.
Modified Thomas Test- requires the subject to sit at the very edge of a bench, then roll back onto the bench while pulling both knees to the chest. Measures hip flexibility.

2.6.4 Target aerobic movement test

Test the ability to sustain a moderate intensity of (any) physical activity by maintaining a heart rate between 70 and 85 percent of maximal predicted heart rate for 15 minutes

2.7 Adaptation of Traditional Indian Folk Games

The Traditional Indian Folk Games has been adapted following framework

Child Name:

Age:

Location:

Use of educational placement: (to decide the game if one of the goal settings is improvement in academic performance)

Level 1	Level 2	Level 3	Level 4
Children in regular class with/without supportive devices	Regular class attendance + supplementary instructional classes	Special classes	Home bound

Table 2: comparison of Brockport physical fitness test before and after Adapted physical ed-

Variable	Pre-test		Post test		Z score	P value
	Median	IQR	Median	IQR		
Skinfold	19	(15,29)	20	(16,29)	-3.241	0.001
Hand grip	20	(10,35)	25	(15,40)	-4.389	<0.001
Seated pushups	16	(14,18)	18	(16,20)	-1.782	0.035
Modified curl ups	44	(30,50)	51	(45,58)	-2.022	0.43
Reverse curl ups	1	(1,1)	1	(1,1)	0.00	1.00
Modified apley's test	3	(2,3)	3	(3,3)	-3.464	<0.001
Modified Thomas test	1	(1,2)	1	(1,2)	-1.414	0.157
Target aerobic movement test	0	(0,0)	0	(0,0)	0.00	1.00

Total of 47 participants were considered for analysis. The data was none normally distributed. Hence, Wilcoxon signed rank test was performed to compare the mean difference before and after intervention.

The difference in skinfold, hand grip, seated push ups, and modified apley's test were significant before and after treatment.

4. Discussion

As per the guidelines of World health organisation, an average of 60 minutes per day of moderate-to-vigorous intensity, mostly aerobic, physical activity, across the week is recommended for a typical child in the age group between 5-17 years. This is relevant for children with cerebral palsy as well. In the western context the mode of obtaining physical activity is through play, games, sports. It is a known fact that the rural scenarios of low- and middle-income countries such as India, Malaysia, etc are at an intangible level to adapt to the western games. But the Traditional Indian folk games are highlighted with the benefits of cost-effective mode to deliver the physical activity by means of adaptation. The objective of the current study was to know the input of Traditional Indian folk games in improving the physical activity in child with cerebral palsy. Among 47 children recruited, 27 were spastic diplegia, 9 was spastic quadriplegia, 5 ataxic, 3 athetoid and 2 hypotonic cerebral palsy. The games were chosen based on the requirement of the children. Short *et al.* (1998) it appears that the BPFT has effectively addressed the measurement and evaluation of aerobic functioning of individuals with ambulation problems. After spending considerable time and energy in trying to develop an acceptable field-based test to measure aerobic capacity and not being successful, it was decided to emphasize the measurement of aerobic behaviour instead. This functional orientation emphasizes the ability to sustain physical activity of a specific intensity for a particular duration. Hand grip improvement in this study is in agreement with the previous study by Winnick *et al.* (1998) Teachers are encouraged to monitor the frequency, intensity, and duration of the physical activity of their more severely involved youngsters and develop strategies for increasing those levels.

Each child was given minimum of 5 to 10 games for a period of 45 mins to 1 hour per day with the frequency of 5 days per week for 6 months

3. Results

Table 1: Demographic characteristics of participants

	Age	BMI
Male	17.8	17.3
Female	16	14.3
Total	17.14	19.14

Increases in physical activity often will lead to increases in physical fitness even if fitness cannot be validly assessed. There is no significance noted with regard to Modified curl up, Reverse curl up, Modified Thomas test and Target aerobic movement test, this might be due to fact that the allocated one particular game is only 10 mins and that particular game doesn't contain all the component that fulfils the health-related components of Physical activity

5. Conclusion

There is a significant change in Physical activity level using Adapted physical education programmes using Traditional Indian folk games.

6. Future Scope

- Adapted Physical education protocol has to be implemented with an increased number of samples.
- This can be disseminated through various facts of India

7. Acknowledgement

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