



Evaluation of Selected Anthropometric Characteristics Physical Fitness and Athletic Performance of RDT Hockey Academy adapted Schoolgirls in the Rayalaseema District of Andhra Pradesh

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Abstract: This investigation was purported to evaluate the selected anthropometric characteristics physical fitness and athletic performance of schoolgirls adapted by RDT hockey academy in the Rayalaseema district of Andhra Pradesh, India. For this reason, 547 schoolgirls from twenty-six (26) schools in four (4) different districts adapted by RDT hockey academy in the Rayalaseema District of Andhra Pradesh, India were considered as subjects. These subjects were in the age group of 11 to 16 years, and they were assessed for their selected anthropometric characteristics (height, weight), physical fitness (speed, explosive power) and athletic performance (100m dash) using standardized tests and procedures. The data collected were subjected to statistical analysis by means of One-way ANOVA, and Bonferroni corrections post hoc test. The confidence interval was fixed at $p < 0.05$ in all cases. The research findings ensure statistically considerable age difference on selected variables, and it implies that age differences influence almost all fitness parameters.

Key words: Physical fitness, athletic performance, hockey, fitness parameters

Introduction

In India, for centuries of years from Vedic age to till date, the gurukuls and schools have played a vital role in the provision of physical activity to children and youth. Now a day, physical education is a mandated part of the school curriculum that too particularly in the State of Andhra Pradesh, India, and it is obligatory to assess and report the level of school student's fitness. The educational aspects of physical education are to develop the knowledge, behavioral skills, and motor skills necessary to develop and maintain a physically active and healthy lifestyle. As such, the priority for physical education is seen as providing opportunities for students to engage in enjoyable physical activity, to become physically fit,



and to learn generalizable motor and behavioral skills [1]. Yet, participation in physical education was reduced by substitutions of other activities for physical education and student exemptions.

Partaking in games and sports has long been assumed to provide health benefits to young players. In spite of certain reservations about this conjecture, the studies of some [2-4] have shown that health benefits accrue to young people who participate in sports.

Customarily, the role of schools in providing and promoting physical activity has been during the school day and on the school campus immediately after school hours. Although there have been exceptions, school-based programs usually have been sponsored by the schools themselves and supervised by school employees. However, enormous potential appears to exist for schools to expand their role in providing students with additional physical activity by building institutional relationships with community-based providers of physical activity. Such relationships could manifest in several ways. Schools can make their facilities available to community based organizations during after-school, weekend, and summer vacation. Also, schools can collaborate with community organizations in promoting physical activity programs to students and their parents. Because transportation can be a barrier to students' participation in after-school programs, schools can collaborate with community organizations, including transit authorities, to ensure that students have the opportunity to participate in programs beyond the school day.

Although school-community linked physical activity programs offer much promise, little research has addressed the efficacy of such initiatives for increasing physical activity in children and youth. The nurturing of young players was carried out by Rural Development Trust (RDT), an NGO based in Anantapur, Andhra Pradesh, India. RDT Hockey academy benefited many young players across Andhra Pradesh, by adapting the students of various schools. Thereby, an attempt was made to record and report the selected anthropometric characteristics physical fitness and athletic performance of schoolgirls of different ages adapted by RDT hockey academy in the Rayalasema district of Andhra Pradesh.

Methodology

In this study, five hundred and forty-seven (547) female school students, aged 11 to 16 years were selected as subjects, at random from the schools adapted by RDT hockey academy spread across the district of Rayalasema, Andhra Pradesh, India. The selected subjects were tested for their anthropometric characteristics (*height and weight*), physical fitness (*speed and explosive power*) and athletic performance (*100m dash*) using standardized tests and procedures. The data collected were subjected to statistical analysis by means of One-way ANOVA, and Bonferroni corrections post hoc test. The confidence interval was fixed at $p < 0.05$ in all cases.



Results

The data on height, weight, speed, explosive power, and 100m dash were analysed for statistical significant age difference using one-way ANOVA. Thereafter, post hoc tests were performed using Bonferroni corrections. All those results were tabulated in tables from 1 through 3.

Table – 1: Mean and Standard Deviations on Anthropometric Measurements and Physical Fitness Components

Variables	Descriptive	Age Groups					
		11 yrs	12 yrs	13 yrs	14 yrs	15 yrs	16 yrs
	N	58	127	206	98	41	16
Height	Mean	139.34	141.83	145.64	150.97	152.02	149.31
	SD	8.15	8.35	7.42	7.62	7.73	12.61
Weight	Mean	29.40	32.50	35.46	39.84	43.20	41.19
	SD	5.96	6.45	5.87	6.25	7.77	5.17
Speed	Mean	6.23	6.10	6.00	5.92	5.92	5.90
	SD	0.50	0.69	0.59	0.58	0.60	0.58
Explosive Power	Mean	1.38	1.42	1.47	1.52	1.52	1.50
	SD	0.16	0.17	0.18	0.20	0.18	0.22
100m Dash	Mean	19.28	19.55	18.80	18.17	18.17	18.53
	SD	1.65	2.04	2.15	2.43	1.99	2.10

The descriptive statistics depicted in Table 1 reveals that all the variables confined to this study improved with age of the schoolgirls. However, the height, weight, power, and 100m dash of the schoolgirls were slightly impinged at the age of 16 years, which might be the result of academic stress, lack of motivation, sports performance saturation, gain in body mass, so on and so forth that needs to be investigated further.



Table – 2: Analysis of Variance on Anthropometric Characteristics Physical Fitness and Athletic Performance

Variables	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Height	Between Groups	8807.898	5	1761.580	27.742	.000
	Within Groups	34289.370	540	63.499		
Weight	Between Groups	8074.912	5	1614.982	41.669	.000
	Within Groups	20929.081	540	38.758		
Speed	Between Groups	5.020	5	1.004	2.760	.018
	Within Groups	196.407	540	.364		
Explosive Power	Between Groups	1.034	5	.207	6.320	.000
	Within Groups	17.664	540	.033		
100m Dash	Between Groups	138.826	5	27.765	6.175	.000
	Within Groups	2428.014	540	4.496		

Table 2 shows that statistically significant difference exists between different ages on height, weight, speed, explosive power, and 100m dash performance as the obtained $F(5, 540)$ is 27.742, 41.669, 2.760, 6.320 and 6.175 respectively, ($p < 0.05$). Since, six different age categories were considered in this study, the statistical analysis was further continued to post hoc test using Bonferroni corrections to find out the paired mean differences, and it was given Table 3.



Table – 3: Post Hoc Tests on Anthropometric Characteristics Physical Fitness and Athletic Performance

Age in Years		Height	Weight	Speed	Explosive Power	100m Dash
I	J					
11	12	2.49	3.11*	0.13	0.03	0.27
	13	6.29*	6.06*	0.23	0.09*	0.48
	14	11.62*	10.44*	0.31*	0.13*	1.11*
	15	12.68*	13.80*	0.31	0.13*	1.11
	16	9.97*	11.79*	0.33	0.12	0.75
12	13	3.81*	2.96*	0.10	0.05	0.75*
	14	9.13*	7.33*	0.18	0.09*	1.38*
	15	10.19*	10.69*	0.18	0.10*	1.38*
	16	7.48*	8.68*	0.20	0.08	1.02
13	14	5.33*	4.37*	0.08	0.05	0.63
	15	6.38*	7.73*	0.09	0.05	0.63
	16	3.67	5.73*	0.11	0.03	0.27
14	15	1.06	3.36	0.00	0.00	0.00
	16	1.66	1.35	0.02	0.01	0.36
15	16	2.71	2.01	0.02	0.02	0.36

From Table 3, it is understood that most of the paired mean differences on height and weight varied between ages. It is also found that the adjacent age categories didn't vary



considerably between them with regard to explosive power, while the speed and 100m dash performance of the girls aged 14 to 16 years were not good enough as it is supposed to be.

In this study, school girls were grouped by chronological age, irrespective of their biological development, so some misclassification for children and adolescents in relation to their biological development may occur. Therefore, it is of interest to examine the associations between health-related physical fitness components and biological age in young girls.

Conclusion

The findings of this study reveal that older girls are taller and heavier, which ensures that the growth and development process were not hindered by means of systematic training program adopted in the RDT hockey academy. Per se, physical fitness and performance variables are generally higher in older girls. But, the result of this study necessitates rigorous training regimen for improving the physical fitness status of girls with regard to their age, as the fitness parameters and athletic performance level were not evidently varied among age categories of schoolgirls adapted by the hockey academy.

References

1. T. L. McKenzie (2003) Health-related physical education: physical activity, fitness and wellness. In: S.J. Silverman, D. Ennis, eds. Student Learning in Physical Education: Applying Research to Enhance Instruction, 2nd Ed, Champaign: Human Kinetics.
2. D. J. Aaron, S. R. Dearwater, R. Anderson, .T Olsen, A. M. Kriska, R. E. Laporte, Physical activity and the initiation of high-risk health behaviors in adolescents, *Medicine and Science in Sports and Exercise*, 27 (1995) 1639 –1645.
3. G. Rossi, R. Moretti, M. Pirone, W. Locatelli, Promoting physical activity: going to school by the Piedibus, *Epidemiol Prev*, 28 (2004) 346 –349.
4. A. A. Skolnick, Studies raise doubts about benefit of athletics in reducing unhealthy behavior among adolescents, *Journal of the American Medical Association*, 270 (1993) 798- 800.