

Effect of Physical Education Programme and Handball Drills on Musculoskeletal Fitness among High School Handball Players

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Abstract

The purpose of the study was to find out the effect of physical education programme and handball drills on musculoskeletal fitness among high school handball players. For the purpose of the study 225 students were given their willingness to act as subjects, out of which 60 students were selected as subjects at random from government high school, Chennai, Tamilnadu, India. The age of the participants ranged between 12 and 15 years. The selected subjects were randomly divided into three groups namely physical education group, handball drill group and control group with twenty subjects ($n=20$) in each group. Experimental groups underwent their respective training for twelve weeks, 4 days per week, sixty minutes per day and the control group did not undergo any training programme apart from their regular curricular activity. The musculoskeletal fitness variables such as muscular strength and muscular endurance were selected as criterion variables. The test items to appraise the criterion variables are muscular strength (pull-ups), muscular endurance (sit-ups), were selected as test items. All the subjects of three groups were tested on criterion variables at prior to and immediately after the training programme. The analysis of covariance (ANCOVA) was used to find out the significant difference. If the obtained 'F' ratio was significant, Scheffe's test was applied as a post hoc to determine the paired means difference. In all the case level of confidence was fixed at .05 level to test the significance. The results of the study proved that there was significant improvement on muscular strength and muscular endurance due to the both training interventions. When compared between the treatment group handball drills groups better than physical education programme group in improving the muscular strength and however there was no significant difference in muscular endurance.

Keywords: Muscular Strength and Muscular Endurance.

Introduction

Physical Education in schools - both quality and quantity are important. Daily quality physical education in the nation's schools is an important part of a student's comprehensive, well-rounded education program and a means of positively affecting life-long health and well-being. The optimal physical education program will foster a lifetime commitment to physical activity as part of a healthy lifestyle. Ultimately, improved coordinated school health programs,

of which physical education is a central component, will augment other to prevention efforts and help to reverse the growing epidemic of childhood obesity which threatens to undo decades of progress in the fight against cardiovascular and other diseases (**Kahn et al., 2002**). Regular physical activity is associated with a healthier, longer life and with a lower risk of heart disease, high blood pressure, diabetes, obesity, and some cancers.

Physical education should be an important part of that requirement and does more than provide some minutes of moderate vigorous activity. It also teaches students how to integrate exercise into their lives in order to establish a lifetime of healthy living. A growing body of evidence demonstrates the benefits of physical education beyond fitness. Several large-scale studies found improvements in students' academic performance and cognitive ability with increased time spent in physical education (**Datar, 2004**). Children who spent time in physical education in place of a classroom activity performed no worse academically than students not enrolled in physical education. Physical activity also has a positive impact on tobacco use, insomnia, depression, and anxiety. The quality of the physical education program, not just the time spent on the class, is the foremost concern (**Coe et al., 2006**).

As public health officials wring their hands about the obesity epidemic, there's a solution that is relatively low-cost, ready to implement and obvious to anyone involved in school health and physical education. Implement quality daily physical education in every school. The effectiveness of physical education depends on not 3 only participation in physical education and extracurricular sports, and measuring their height and weight. It depends on more days of physical education participation per week, the greater the chance that students would maintain a healthy body weight into adulthood (**Castelli et al., 2007**).

Sport is from an inspirable part of the system of physical education. Physical education offers opportunity in competitive situation for physical, social, emotional and moral development. Sports and games are the best ways to earn social recognition and acquire a status in the modern society. The term motor ability is used synonymously with general athletic ability. There are many factors that contribute to successful performance in athletic skill. In most of the advanced and developed countries, the awareness for motor learning and skill developed among children is very much scientific 6 and prolonged which perhaps helped them to level of general fitness with motor abilities like power, speed, agility, balance, reaction time etc. are essential qualities required to be develops in the players (**Suresh, 2010**).

Methods

The purpose of the study was to find out the effect of physical education programme and handball drills on musculoskeletal fitness among high school handball players. To achieve the purpose of the study 255 students given their willingness to act as subjects, out of which 60 students were selected as subjects at random from government high school, Chennai, Tamilnadu, India. The age of the participants ranged between 12 and 15 years. The selected subjects were randomly divided into three groups namely physical education group, handball drill group and control group with twenty subjects ($n=20$) in each group. Experimental groups underwent physical training handball drills and the control group did not undergo any training programme apart from their regular curricular activity. All subjects were informed about the nature of the study and their consent was obtained to co-operate till the end of the experiment and testing period. The subjects were free to 60 withdraw their consent in case they felt any discomfort during the period of their participation, but there were no dropouts. A qualified physician examined the subjects medically and declared them fit for the study. The analysis of covariance (ANCOVA) was used to find out the significant difference. In all the case level of confidence was fixed at 05 level to test the significance. Physical education programme such as, Free hand exercises, Light apparatus exercise (Dumbbells, Wands, Lazime and Hoops), Minor games (Relay games, Ball relay games and tag games), Aerobic dance. Handball Drill such as, Chest pass, Long pass, Overhead pass, Run with ball passing relay, Bounce pass. Jump and shoot, Wrist pass, High dribble, two men pass, and Low dribble.

Results on Muscular Strength

Table-I shows the mean, standard deviations and 'F' ratio of muscular strength of physical education group, hand ball group and control group. The below table shows, the pre-test mean value on muscular strength of physical education group, handball drill group and control group were 2.75, 2.70 and 3.05 respectively. The obtained 'F' ratio value 1.78 for pre-test means on muscular strength was lesser than the required table value 3.15 for significance at .05 level of confidence with df 2 and 57. The post-test mean value on muscular strength of physical education group, handball drill group and control group were 3.90, 4.90 and 2.95 respectively. The obtained 'F' ratio value 52.74 was greater than the required table value of 3.15 for significance at .05 level of confidence with df 2 and 57.

Table-I
ANCOVA of Muscular Strength among Physical Education Group
Hand Ball Group and Control Group

Test		Physical Education Group	Hand Ball Group	Control Group	SV	SS	df	MS	'F' Ratio
Pre	Mean	2.75	2.70	3.05	B	1.43	2	0.71	1.78
	S.D.	0.63	0.65	0.60	W	22.90	57	0.40	
Post Test	Mean	3.90	4.90	2.95	B	38.03	2	19.01	52.74*
	S.D.	0.78	0.55	0.39	W	20.55	57	0.36	
Adjusted Post Test	Mean	3.94	4.97	2.83	B	43.17	2	21.58	84.45*
					W	14.31	56	0.25	

* Significant at .05 level of confidence. (The table values required for significance at .05 level of confidence for 2 and 57 and 2 and 56 are 3.15 and 3.16 respectively).

The adjusted post-test mean value on muscular strength of physical education group, handball drill group and control group were 3.94, 4.97 and 2.83 respectively. The obtained 'F' ratio value 84.45 for adjusted post-test means on muscular strength, was greater than the required table value 3.16 for significance at .05 level of confidence with df 2 and 56. The results of the study showed that there was significant difference among the adjusted post-test means of physical education group, handball drill group and control group on muscular strength. Hence, it was concluded that physical education programme and handball drill improves muscular strength. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table -II.

Table-II
The Scheffe's Post hoc Test for the Differences between Paired Means on Muscular Strength

Physical Education Group	Handball Drill Group	Control Group	Mean Differences	Confidence Interval Value
3.94	4.97	-	1.03*	0.40
3.94	-	2.83	1.11*	0.40
-	4.97	2.83	2.14*	0.40

*Significant at .05 level of confidence.

The table II shows that the mean difference values between Physical education group and handball drill group, handball drill group and control group, physical education group and control group were 1.03, 1.11 and 2.14 on

muscular strength which were greater than the required confidence interval 0.40 for significance. When compared between the treatment groups the results of this study showed that there was significant difference between physical education programme group and handball drill group on muscular strength.

Muscular Endurance

Table III shows the mean, standard deviations and 'F' ratio of muscular endurance of physical education group, hand ball group and control group.

Table-III
ANCOVA of Muscular Endurance among Physical Education Group,
Hand Ball Group and Control Group

Test		Physical Education Group	Hand Ball Group	Control Group	SV	SS	df	MS	'F' Ratio
Pre	Mean	21.00	21.90	22.45	B	21.43	2	10.77	1.64
	S.D	3.21	2.61	1.53	W	370.75	57	6.50	
Post Test	Mean	23.50	24.40	22.25	B	46.63	2	23.31	3.98*
	S.D	2.64	2.86	1.55	W	333.55	57	5.85	
Adjusted Post Test	Mean	23.92	24.33	21.88	B	66.91	2	33.45	8.32*
					W	225.06	56	4.01	

*Significant at .05 level of confidence.(The table values required for significance at .05 level of confidence for 2 and 57 and 2 and 56 are 3.15 and 3.16 respectively)

Table III shows, the pre-test mean value on muscular endurance of physical education group, handball drill group and control group were 21.00, 21.90 and 22.45 respectively. The obtained 'F' ratio value 1.64 for pre-test means on muscular endurance was lesser than the required table value 3.15 for significance at .05 level of confidence with df 2 and 58. The post-test mean value on muscular endurance of physical education group, handball drill group and control group were 23.50, 24.40 and 22.25 respectively. The obtained 'F' ratio value 3.98 for post-test means on muscular endurance was greater than the required table value 3.15 for significance at .05 level of confidence with df 2 and 57.

The adjusted post-test mean value on muscular endurance of physical education group, handball drill group and control group were 23.92, 24.33 and 21.88 respectively. The obtained 'F' ratio value 8.32 was greater than the required table value of 3.16 for significance at .05 level of confidence with df 2 and 56.

The results of the study showed that there was significant difference among the adjusted post-test means of physical education group, handball drill group and control group on muscular endurance. Hence, it was concluded that physical education programme and handball drill improves muscular endurance. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table -IV.

Table-IV
The Scheffe's Post hoc Test for the differences between Paired Means on Muscular Endurance

Physical Education Group	Handball Drill Group	Control Group	Mean Differences	Confidence Interval Value
23.92	24.33	-	0.41	1.58
23.92	-	21.88	2.04*	1.58
-	24.33	21.88	2.45*	1.58

*Significant at .05 level of confidence.

The table IV shows that the mean difference values between handball drill group and control group and physical education group and control group were 2.04 and 2.45 on muscular endurance which were greater than the required confidence interval 1.58 for significance. And also the mean difference between physical education group and handball drill group 0.41 on muscular endurance which was lesser than the required confidence interval value 1.58.

The results of this study showed that there was a significant difference between and handball drill group and control group and physical education group and control group on muscular endurance. And no significant difference was found between physical education group and handball drill group on muscular endurance.

Discussion on findings

Daily quality physical education in the nation's schools is an important part of a student's comprehensive, well-rounded education program and a means of positively affecting life-long health and wellbeing. The optimal physical education program will foster a lifetime commitment to physical activity as part of a healthy lifestyle. Ultimately, improved coordinated school health programs, of which physical education is a central component, will augment other prevention efforts and help to reverse the growing epidemic of childhood obesity which threatens to undo decades of progress in the fight against cardiovascular and other

diseases. Effective efforts made now will help children avoid a lifetime of chronic disease and disability. The school physical education curricula were experienced across diverse racial, ethnic, and socioeconomic groups, among boys and girls, elementary- and high school students, and in urban and rural settings (Kahn et al, 2002).

Limited literatures which analyzed studies comparing the effects of physical education programme and game related drill (handball drill) seem to indicate that the physical education may be as effective as or better in improving a variety of health-related measures. It was also reported that more research is necessary to discern the distinctions between physical education and game related drills.

The results of the study showed that there was a significant difference among physical education group, handball drill group and control group on selected criterion variables namely muscular strength and muscular endurance. The study findings further suggest that the physical education programme if well programmed and supervised can improve health related fitness.

Conclusions

It was concluded that physical education programme group and handball drill group significantly improved muscular strength of the school boys and comparing between the experimental groups, it was found that handball drill group was significantly better than physical education programme group.

It was concluded that physical education programme group and handball drill group significantly improved muscular endurance of the school boys and comparing between the experimental groups, it was found that there was no significant difference between the groups.

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