

Vol 4 Issue 1 Oct 2014

ISSN No : 2249-894X

*Monthly Multidisciplinary
Research Journal*

*Review Of
Research Journal*

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RNI MAHMUL/2011/38595

ISSN No.2249-894X

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EXPLOSIVE POWER AND AGILITY OF SECONDARY SCHOOL STUDENTS: AN EMPIRICAL IMPACT OF VOLLEYBALL TRAINING

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Abstract:- The purpose of the study was to witness the impact of twelve week of volleyball training on explosive power and agility of secondary school male students. For this purpose, a sample of thirty (N=30) randomly selected male secondary school going students were selected from schools affiliated to Punjab School Education Board, Gurdaspur, Punjab, India of age ranging from 16-19 years. They were informed about the objectives and methodology of the study and they volunteered to participate in the study. Further, they were randomly assigned into two groups: A (experimental N1=15) and B (control N2=15). The subjects from Group A were subjected to a 12-week's basic volleyball training programme. Both experimental and control groups were assessed for Pre training and post training measurements of height, weight, explosive power and agility. The height of the subjects was measured with anthropometric rod to the nearest 0.5 cm. The weight of subjects was measured by using portable weighing machine to the nearest 0.5 kg. The vertical jump test was used to measure explosive power of the legs whereas Illinois agility test was used to measure agility. The paired samples t-test was used to assess the pre training and post training differences on experimental and control groups respectively. The results of present study clearly indicated significant differences on pre training and post training of experimental group with regards to explosive power ($p<0.05$) and agility ($p<0.05$) but insignificant differences were found on pre test and post test of control group with regards to explosive power ($p>0.05$) and agility ($p>0.05$).

Keywords: Volleyball training, explosive power, agility.

INTRODUCTION

Volleyball is one of the popular sports in India. It is a sport that requires players to compete in frequent short bouts of high-intensity exercise, followed by periods of low-intensity activity (Kunstlinger et al., 1987; Viitasalo et al., 1987). Considerable demands are also placed on the neuromuscular system during the various sprints, jumps (blocking and spiking), and high-intensity court movement that occurs repeatedly during competition (Hakkinen et al., 1993). Training programs for volleyball players can benefit their physical and physiological development (Lidor et al., 2010). Sport training and exercise are essential components of a physical and health related fitness development. Training or physical activity done regularly improves the physical working capacity of an individual (Ahmed, 1999). It is accepted that increased physical activity and

musculoskeletal stress are important for promoting growth in children (Bailey et al., 1978; Borer, 1995). Moreover, children's involvement in sport training might provide particular long-term health benefits (Rowland, 2005). Changes in the physical and physiological characteristics of volleyball players in response to training have been documented (Franks & Moore, 1969; Hascelik et al., 1989). Studies, with reports of the effect of volleyball and physical conditioning training on the physical and physiological characteristics of players (Franks & Moore, 1969; Hascelik et al., 1989), are increased in response to training. In addition, it was recently shown that volleyball training significantly improved the skill levels of volleyball players (Lidor et al., (2007). Several studies have investigated the effects of different types of intensive exercise as well as training on physiological variables (Brodthagen et al. 1985; Schmidt et al., 1988; Schobersberger et al., 1990). Therefore, the purpose of the study to find out the effects of volleyball training on explosive power of the legs and agility of students.

MATERIAL AND METHODS

Subjects:

A sample of thirty (N=30) randomly selected male secondary school going students were selected from schools affiliated to Punjab School Education Board, Gurdaspur, Punjab, India of age ranging from 16-19 years was selected. They were informed about the objectives and methodology of the study and they volunteered to participate in the study. Further, they were randomly assigned into two groups: A (experimental N1=15) and B (control N2=15).

Methodology:

The subjects from Group-A i.e. experimental group, were undergone a 12-week's basic volleyball training programme, with consistent daily 50 min session, continuous for five days in a week but no such training programme was assigned to Group-B i.e. control group. Both experimental and control groups were assessed for Pre training and post training measurements of height, weight, explosive power and agility. The height of the subjects was measured with anthropometric rod to the nearest 0.5 cm. Full attention was given to make sure that players' body was fully upright and their mandible was parallel to the ground. Taken values recorded in 'cm'. The weight of subjects was measured by using portable weighing machine to the nearest 0.5 kg. During measurements players were on bare feet and wearing underwear only. Measurements recorded in 'kg'. BMI was calculated by the formula of; $\text{Body Mass Index} = \text{Weight}/\text{Height}^2$. The vertical jump test was used to measure explosive power of the legs whereas Illinois agility test was used to measure agility.

Table 1: Description of Variables and respective Tests of their Measurement.

Variables	Test Used	Measurement Units
Explosive power	Vertical Jump Test (Fleishman, 1964)	Centimeters
Agility	Illinois Agility Test (Getchell, 1985)	Seconds

Data Analysis

Values are presented as mean values and SD. The paired samples t-test was used to assess the pre training and post training differences on experimental and control groups respectively. Data was analyzed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SPSS Inc, Chicago, IL, USA). The alpha level was set at 0.05.

RESULTS

Table 2: Mean Values (\pm SD) and test static t of Pre Test and Post Test of Experimental and Control Groups with regards to Explosive Power and Agility.

Variables	Experimental Group		t- ratio	Control Group		t- ratio
	A (N ₁ =15)			B (control N ₂ =15)		
	Pre-Test Mean (\pm SD)	Post-Test Mean (\pm SD)		Pre-Test Mean (\pm SD)	Post-Test Mean (\pm SD)	
Power (cm)	43.67(\pm 4.54)	47.67(\pm 4.32)	4.205*	42.13 (\pm 3.48)	41.73(\pm 3.05)	0.612
Agility (sec)	19.81(\pm 0.99)	16.86(\pm 0.86)	3.759*	19.85 (\pm 0.94)	19.88(\pm 0.76)	0.182

*Significant at 0.05 level

Table-2 exhibited the Mean Values (\pm SD) and test static t of pre test and post test of experimental and control groups of secondary school students with regards to explosive power and agility. It is evident from table-1 that, experimental group exhibited, the pre and post-test mean values 43.67 and 47.67 with regards to explosive power whereas 19.81 and 16.86 with regards to agility respectively. The critical value of t at 95% probability level is much lower (2.145) than the observed value of t (4.205*) on explosive power and (3.759*) on agility. The data does suggest that the differences between pre and post test of experiment group with regards to explosive power and agility were significant. However, on the other hand control group exhibited, the pre and post-test mean values 42.13 and 41.73 with regards to explosive power whereas 19.85 and 19.88 with regards to agility respectively. The critical value of t at 95% probability level is much higher (2.145) than the observed value of t (0.612) on explosive power and (0.182) on agility. The data does suggest that the differences between pre and post test of control group with regards to explosive power and agility were insignificant.

DISCUSSION

The results have shown the presence of significant differences in the mean of explosive power and agility between pre and post test of the experimental group. This indicates that the training program has a positive role to play in the volleyball training program. This supports that volleyball training program improves explosive power and agility. The research results agree to results of previous studies (Golhy & Moor, 1993; Abd El-Fattah, 1997; Ahmed, 1999; Hamad, 2001). They all, indicated to the possibility of using the exercises in the team games aiming to develop the physical fitness elements. The findings of the present study are in line with the study of Lidor et al., (2007), who investigated the effects of 15 month volleyball training using with the motor, physical and skill tests in fifteen male adolescent volleyball players. They found that participants improved their performance. Our results are also in parallel to the previous study conducted by Elif et al. (2010), who investigated the effect of 4 months volleyball training on twenty preadolescent girls. They found that 4 months volleyball training improved the jumps (vertical jump & standing long jump test) and speed (20 m run test) and agility (Illinois agility test) performance. In light of the above mentioned studies, the present study confirms that the suggested training program increased the explosive power and agility.

CONCLUSIONS

It is concluded that significant differences were found on pre training and post training of experimental group with regards to explosive power and agility but insignificant differences were found on pre test and post test of control group with regards to explosive power and agility. The present study confirms that the suggested training program increased the explosive power and agility.

ACKNOWLEDGEMENTS

Sincere thanks to Teachers who extended their enthusiastic co-operation in collecting the necessary data and to all those students without whom this research was not possible. We acknowledge the immense help received from the scholars whose articles are cited and included in references of this paper. We are also grateful to authors/editors/publishers of all those articles, journals and books from where the literature for this paper has been reviewed and discussed.

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