

APPLICATION OF PLYOMETRIC STRENGTH DEVELOPMENT EXERCISES FOR MALE VOLLEYBALL PROFESSIONAL STUDENTS OF PHYSICAL EDUCATION FACULTY AT AN GIANG UNIVERSITY

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Abstract:

By the necessary scientific methods, the study has chosen and successfully applied the Plyometric exercise system, thereby developing the strength for male Volleyball professional students in the first year of Physical Education Faculty at An Giang University.

Key words: Strength development exercise, Plyometric

INTRODUCTION

The Plyometric is the basic strength training method, followed by the continuation of a progressive activity on the maximum muscle tension basis. This method helps players to consume low energy, limit injuries and bring about efficiency in training. Based on the actual conditions and the limited physical strength level of Volleyball professional students, we have studied the research of "Application of Plyometric strength development exercises for male Volleyball professional students of Physical Education Faculty at An Giang University" contributing to improving the learning achievement and professional capacity for the students.

RESEARCH METHODS

During the research, we have used the methods of analysis and synthesis of documents, interview with experts, pedagogical examination, pedagogical experiment and mathematical statistics

RESULTS AND DISCUSSION

1. Selection of Plyometric strength development exercises for male Volleyball professional students of Physical Education Faculty at An Giang University

Through the methods of studying references by Vietnam and foreign experts (Luis Cortegaza (2011), Gonzales (2002), Nguyen Thanh Lam

(1998), Nguyen Hiep and Bui Trong Toai (2004)) and interviewing Volleyball experts and coaches of high performance team (Binh Dien Long An, Sannest Khanh Hoa), we have selected 9 strength of leg training exercises and 10 strength of hand training exercises by the Plyometric with a high approval rate (75%). Specifically:

- 9 strength of leg training exercises: Run at speed of 30m/s, board jump 60m/s, single-under jump rope 1'30 /time, standing box jump 30s/time, forward alternate leg box hops 30s/time, high knees jump 30s/time, squats (kg/time), squat jump 15kg/time, hurdle jump 60m/s.

- 10 strength of hand training exercises: Overhead bicep curls (kg), barbell curl (kg), barbell bench press (kg/time), dumbbell bench press (kg/time), Overhead Reverse Grip Cable Extension (kg/time), push up- feet on bench (group/ time), resistance band overhead press with dominant hand (30s/time), 1-step shooting- 2 hands, 1- hand shoot the basketball ball over net

2. Application and evaluation of Plyometric strength development exercises for male Volleyball professional students of Physical Education Faculty at An Giang University

2.1. Experimental organization

Based on the results of the exercise selection, the have applied the exercises in the experiment.

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Physical education for students in schools at all levels is an important subject helping to improve student physical fitness

Experimental duration is 12 weeks (from September to December 2015), 3 sessions per 1 week with total time of 120 sessions. The control group (33 males) practices with the common plan of strength development exercise for male Volleyball professional students at An Giang University. Experimental group (31 men) practices with the plan of selected strength development exercise. Specifically, on Monday and Wednesday, they do 3 leg exercises and 3 hand exercises, on Friday, they do 3 leg ones and 4 hand ones. The exercises practice alternately, in which each exercise performs 2-

3 groups with near and maximum intensity (depending on the feature of the exercise). Time for each session is 30-40 minutes.

2.2. Evaluation of Plyometric strength development exercises for male Volleyball professional students

After 12 weeks of Plyometric strength training program, the study has compared the performance of the two groups through four tests: High jump (cm); high standing jump (cm); long jump (cm), 1kg ball shoot with 2 hands (m). Comparison results are in Table 1.

Table 1. Results of 2 groups before and after experiment

No.	Test	Experimental group		Control group		t	P
		n=31		n=33			
Before experiment		$\bar{X}$	$\pm\delta$	$\bar{X}$	$\pm\delta$		
1	High jump (cm)	73.41	5.69	73.16	5.89	0.15	> 0.05
2	High standing jump (cm)	70.13	4.91	72.08	5.14	0.19	> 0.05
3	Long jump (cm)	247.00	16.32	251.00	14.20	0.75	> 0.05
4	1kg ball shoot with 2 hands (m)	11.89	0.95	11.84	0.85	0.42	> 0.05
After experiment							
1	High jump (cm)	84.90	5.91	75.6	6.96	3.69	<0.001
2	High standing jump (cm)	79.20	5.60	74.9	6.06	2.71	<0.01
3	Long jump (cm)	286.00	15.12	271.00	14.63	2.28	<0.05
4	1kg ball shoot with 2 hands (m)	13.86	1.27	12.44	0.84	3.75	<0.001

Table 2. Growth rate of experimental and control groups before and after experiment

No	Test	Experimental group		W%	Control group		W%
		Before experiment	After experiment		Before experiment	After experiment	
1	High jump (cm)	73.41	84.9	14.51	73.16	75.6	3.28
2	High standing jump (cm)	70.13	79.2	12.15	72.08	72.9	1.13
3	Long jump (cm)	247	286	14.63	251	271	7.66
4	1kg ball shoot with 2 hands (m)	11.89	13.86	15.3	11.84	12.44	4.94
W% average				14.15			4.15

Table 1 shows that before experiment, the results of the two groups are not different, but after the experiment, there is a marked difference in all tests, especially in the tests of high jump and 1kg ball shoot with 2 hands (m) ($p < 0.001$).

We have evaluated the growth rate (W%) of the criteria after experiment in comparison with before the experiment of two research groups. Results are in Table 2.

The results of Table 2 show that the average growth rate of the control group is 4.15% and that of the experimental group is 14.15%, which means that the growth rate of the experimental group has significant increase than the control group. Thus, after 120 sessions of Plyometric strength development exercises, the evaluation criteria of the experimental group have good improvement compared to the control group. This demonstrates that the selected exercises have a positive effect on the strength development of the students.

CONCLUSION

1. On the basis of the document analysis and synthesis, and interviews with experts, the study has selected 10 exercises to develop the strength of upper limbs and 9 exercises to develop the strength of lower limbs.

2. Through experiment, the study prove the effectiveness of the selected Plyometric strength development exercises, enhancing the strength

of male Volleyball professional students in the first year of Physical Education Faculty at An Giang University.

REFERENCES

1. Nguyen Xuan Dung (1998), "Initial research on several indexes of physical strength and morphology by male Volleyball gifted athletes aged 14-16 in some Southern provinces".
2. Nguyen Thanh Lam (1998), "Research on typical physical strength aptitude development of female Volleyball athletes aged 15-18 ", Dissertation on educational Doctor.
3. Bui Trong Toai (1996), "Research on physical strength test system determination for young male Volleyball athletes" Master thesis, Ho Chi Minh City.

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