

Effective Determination of Speed Strength Development Exercises for Male National Team badminton Players Aged 13 - 15

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Abstract

The results of determining the effectiveness of 45 groups of exercises/exercises to develop strength and speed for male badminton players of the Vietnamese team aged 13-15 after one year of experimentation have brought a difference. The performance of 6 test tests of the experimental group increased significantly over the training period. The percentage of standard ratings of the experimental group was higher and different from that of the previous year's athletes.

Keywords— Exercise, speed strength, players, badminton, aged 13-15, Vietnam.

ARTICLE SOURCE

Extracted from the research results of the topic "Research on exercises to develop speed-strength for male national team badminton players aged 13-15" - Doctoral thesis in education, Institute Sports Science.

I. ASK THE PROBLEM

Physical training for badminton athletes aims to improve the limits of motor qualities, and work capacity, and control the motor organs as well as the entire system of organs to achieve the goal. The key is to withstand an increasing amount of exercise, to ensure that the process of transformation and adaptation takes place continuously under the influence of training, to maintain a steady state of the body, a state of athletic fitness as well as prolonging sports life, constantly improving the performance of athletes.

Human motor qualities are expressed in sports activities in general and badminton in particular, including Speed, strength, endurance, coordination, and flexibility. These qualities have a great influence on a person's physical capacity, and mobility in training and playing badminton and play a decisive role in the individual's peak sports achievements. Therefore, in training, the issue of primary concern is physical training, the content of which develops the general physical qualities and important professional qualities for badminton players.

Developing physical qualities is the basis for acquiring and mastering badminton techniques, to apply badminton techniques flexibly and creatively in competition. In other words, the effective acquisition and application of badminton techniques and tactics can only be done based on general physical strength and solid expertise.

Physical training also ensures the development of a close relationship between the improvement of the athlete's physical capacity and the improvement of psychological capacity, which has a positive impact on the education of personality qualities, especially moral education, and willpower for athletes. This is reflected in the efforts to complete the volume of training, and strive to surpass their achievements to rise to new achievements. Cultivate firmness, initiative, and creativity in competition.

The development trend of modern badminton with a transformative, pragmatic and effective style requires athletes to have high adaptability to a large amount of movement and a high ability to coordinate movements in many tournaments during the year. Therefore, the application of strength training exercises is one of the basic and important tasks in all combat sports. Especially badminton, this is the most important factor in the training of athletes. Athletes with good speed and strength can promote techniques and tactics in both training and competition. Speed strength training exercises must ensure the full development of strength for muscle groups involved in the main techniques of badminton, and

exercises must use the movement structure and methods. A form of force that tries to approach or resemble the technical movements of badminton. Exercises to develop speed strength in the practice of badminton training are many types of exercises, very diverse and rich. Therefore, evaluating the effectiveness of speed strength training exercises after each training period is essential for male national badminton players aged 13-15.

II. RESEARCH METHODS

The research process uses methods: document analysis and synthesis method, interview method, pedagogical test method, pedagogical experimental method, and mathematical and statistical method.

The experimental subjects were 15 male badminton athletes, male badminton players, and national team badminton players aged 13-15. The experimental process is applied to 45 groups of exercises/exercises to develop strength and speed selected by the topic. Evaluation of the athlete's strength and speed evolution through 6 tests between three training periods (Phase 1 - Initial, Phase 2 - Mid-trial, and Phase 3 - End of the experiment).

Using R software to calculate the characteristic parameters, t-test, and when squared (Chi-Square test) according to each experimental time.

Table 1. Progress of phased exercise application in speed strength training of national team badminton players aged 13-15

Stage	Content
Before the competition period	2-3 strength training sessions per week. Mainly focus on maximum strength exercises
The start of the competition period	2 strength training sessions a week. Have one session specifically for weight training and the other is usually a station workout that uses a variety of exercises to build strength.
In the middle of the competition	Use a mix of reactive and explosive strength training sessions. Do not perform strength exercises that make the body too tired
Competition period	Do 1 session of strength training (explosive or reactive). High-intensity requirements, but shorter duration than usual, are suitable for tapering plans. Let's say if there's a big competition over the weekend, it'll be done on Monday or Tuesday.

Table 2. The process of applying weekly exercises in training strength and speed for male national team badminton players aged 13-15

Rank \ Content	2	3	4	5	6	7	Total week
Muscle strength	Heavy		Light		Medium		3
Speed power	Medium		Heavy		Light		3
Speed of movement		Heavy		Light		Medium	3
Endurance	Nhẹ		Medium		Heavy		3

III. RESEARCH RESULTS AND DISCUSSION

3.1. Experimental organization.

The whole experimental process was conducted for 12 months (from January 2021 to December 2021). The subject of the pedagogical experiment is a male national team badminton player aged 13-15 who practices at the Danang National Sports Training Center.

The experimental group consisted of 15 male national badminton players from 3 age groups, including 10 players aged 13-14 and 5 players aged 15.

System of applied exercises: Using scientific methods, the subject has selected 45 groups of exercises/exercises to apply in the annual training program for training lesson plans. Specifically: Strength training with 11 groups of exercises (General Strength, Compound, Stuffed Ball, Plyometrics, Fartlek, Fitness, Stationary, Weight training, Climbing/Downhill, Exercises with elastic bands, Flexibility, and flexibility); Professional exercises (34 exercises).

The process of applying selected exercises in speed strength training for male national badminton players aged 13-15 are presented in Tables 1 and 2.

Flexible		Light		Medium		Heavy	3
Total days	3	2	3	2	3	2	15

Based on the selected exercises, combined with the orientations on the training plan, allocating the proportion of exercises, and distributing the exercise volume, the coach develops a lesson plan for each training session. for male national team badminton players aged 13-15

Evaluation: Using 6 pedagogical tests to ensure reliability, and informality and build a scoreboard on a C-

scale, a summary table to assess speed strength for male team badminton athletes National age 13-15.

3.2. Evaluation of strength and speed development for male national badminton players aged 13-15 through experimental periods.

The results of the tests to assess strength and speed for male national badminton players aged 13-15 are presented in Tables 3 and 4.

Table 3. Results of self-comparison of tests to assess strength and speed of male national badminton players aged 13-14 through experimental periods (n = 10)

No	Test	Phase 1		Phase 2		Phase 3		t		
		\bar{x}	δ	\bar{x}	δ	\bar{x}	δ	1-2	2-3	1-3
1	High bounce in place (cm)	42.1	3.4	47.4	3.6	53.2	2.7	6.335*	7.307*	14.212*
2	Thrust in place (cm)	177.7	13.3	196.8	11.6	215.3	11.6	12.104*	12.146*	23.828*
3	Throw the stuffed ball 5kg (cm)	440.6	35.2	495.4	34.2	550.4	33.7	20.802*	21.107*	41.830*
4	Move across the court in combination with pushing 10 balls (s)	21.4	1.7	18.6	1.8	15.7	1.3	4.733*	5.209*	10.407*
5	Moving speed combined with hitting the shuttlecock at 4 points on the court (s)	18.1	1.6	15.5	1.4	13.3	1.2	4.747*	4.315*	9.071*
6	Moving speed increases according to the cue of hitting the shuttlecock at 4 points on the field (level)	6.3	1.1	7.7	1.4	9.5	1.2	2.800*	3.530*	6.672*

* P < 0.05

Table 4. Results of self-comparison of tests to assess strength and speed of male national team badminton players aged 15 through experimental periods (n = 5)

No	Test	Phase 1		Phase 2		Phase 3		t		
		\bar{x}	δ	\bar{x}	δ	\bar{x}	δ	1-2	2-3	1-3
1	High bounce in place (cm)	49.3	2.8	53.4	3.3	56.8	3.6	3.712*	2.894*	6.629*
2	Thrust in place (cm)	190.1	11.3	208.1	12.1	224.2	12.4	8.321*	7.273*	15.663*
3	Throw the stuffed ball 5kg (cm)	497.1	33.6	549.2	36.7	598.8	34.2	13.895*	13.172*	27.618*
4	Move across the court in combination with pushing 10 balls (s)	18.3	1.5	16.3	1.4	14.3	1.3	2.626*	2.722*	5.345*
5	Moving speed combined with hitting the shuttlecock	15.4	1.1	13.8	1.2	12.2	1.1	2.359*	2.359*	4.824*

	at 4 points on the court (s)									
6	Moving speed increases according to the cue of hitting the shuttlecock at 4 points on the field (level)	7.5	1.1	9.3	1.2	11.1	1.3	2.654*	2.546*	5.196*
* P < 0.05										

From the results obtained in Table 3 to Table 4, it shows that: When comparing by the self-comparison method in the fitness assessment tests after the experimental time of the 2 groups of 13-14 years old and 15 years old, the t values are equal. There is a significant difference at the probability threshold of $P < 0.05$. It shows that, after a period of experimentation, the selected exercise system has brought a remarkable effect in developing strength and speed for male national badminton players aged 13-15.

3.3. Comparison according to the general ranking criteria between male badminton players aged

Table 5. Comparison according to the synthetic rating criteria for assessing strength and speed for male national team badminton players aged 13-15

Classification	Result of the built-in standard rating		Total
	Nhóm thực nghiệm (n=15)	Nhóm đối chứng (n=14)	
Obtain	14	7	21
	93.3%	50.0%	
Not achieved	1	7	8
	6.7%	50.0%	
Total	15	14	29
Accreditation	$\chi^2 = 4.811$; $P = 0.023 < 0.05$		

From the results obtained in Table 5, it can be seen that, when comparing the results of the rating of combined rating of speed strength for male national badminton players aged 13-15, it shows that: The passing rate of athletes in the experimental group was 93.3% higher than in the control group of 50.0%. The rate of failure in the experimental group was 6.7% lower than the control group's 50.0%. There is a significant difference in the results of the combined ranking between the two groups of athletes with $\chi^2 = 4.811$ at the probability threshold of $P < 0.05$. That once again affirms the effectiveness of the system of exercises to develop strength and speed for the selected male national badminton players aged 13-15.

IV. CONCLUSION

The system of selected exercises has shown its effectiveness after 12 months of pedagogical experiment. Performance and synthetic ratings were different between the experimental period and when compared with Badminton players 13-15 years old the year before. The results of the analysis and evaluation have confirmed the effectiveness of the selected exercises in developing strength and speed for male national badminton players aged 13-15.

REFERENCES

- [1] R. Baechle Thomas (1994), *Essentials of Strength Training and Conditioning*, Human Kinetics.
- [2] D Cabello Manrique, J J González – Badillo (2003), *Analysis of the characteristics of competitive badminton*,

British Association of Sport and Exercise Medicine, Online:
ISSN 1473-0480, Print: ISSN 0306-3674.

- [3] V. Heyward (2006), *The Physical Fitness Specialist Certification Manual*, The Cooper Institute for Aerobics Research, Dallas TX, revised 2005.
- [4] Michael G, Hughes & Badminton England (2006), *The Badminton Fitness Testing*, National Badminton Centre.
- [5] Nguyen Van Tuan (2000), *Data analysis with R*, General Publishing House, City. Ho Chi Minh.