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## Effectiveness of exercises to improve speed power for male students in the badminton classes at faculty of physical education and sports, Thai Nguyen University of Education, Thai Nguyen University

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### Abstract

Using regular scientific research methods, we selected 12 exercises that contribute to improving speed power for male badminton students at the Faculty of Physical Education and Sports, Thai Nguyen University of Education - Thai Nguyen University. Experimental results have demonstrated the effectiveness of these exercises in developing speed power for research subjects.

**Keywords:** Exercises, speed power, badminton, faculty of physical education and sports, Thai Nguyen University of Education

### Introduction

Badminton is a competitive sport. To achieve high results in studying, practicing, and competing, it depends on many factors such as: Physical strength, psychology, guiding ideology, technique, tactics, in which speed power of movement are one of the decisive factors in the effectiveness of each shot. Therefore, in the basic technical system of badminton, speed power is very important factor, it ensures the effective implementation of other badminton techniques.

Through observing Badminton lessons, practices and competitions, many male badminton students from the Faculty of Physical Education and Sports, Thai Nguyen University of Education show that their speed power is still limited. Lack of flexibility in performing movements and not high efficiency.

Therefore, researching the effectiveness of exercises to improve speed power for badminton students at the Faculty of Physical Education and Sports, Thai Nguyen University of Education - Thai Nguyen University is a necessary and meaningful issue, contributing to improving the quality of training as well as the academic and competitive achievements of students.

### Research Methods

- **Theoretical research methods:** Using methods helps us collect theoretical information, analyze, synthesize and systematize that knowledge, thereby forming a theoretical basis for research
- **Interview methods:** This method aims to interview experts, coaches, and teachers about the use of exercises to evaluate speed power. The interview results will select appropriate exercises to evaluate speed power for male students in badminton class at Faculty of Physical Education and Sports, Thai Nguyen University of Education – Thai Nguyen University.
- **Investigation and survey methods:** Used to collect information about related issues such as: current state of facilities, badminton teaching program for students, etc.
- **Pedagogical observation methods:** Using direct observation method to collect information from practice on the current status of the Badminton curriculum, the current status of using speed power exercises of male badminton students.

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- **Pedagogical experimental methods:** After interviewing and providing exercises to assess strength and speed for male badminton students, the research conducted to develop an experimental plan with 24 male badminton students from the Faculty of Physical Education and Sports, divided into 2 groups, these 2 groups are relatively equal in age and physical level, specifically:

+ **Comparison group:** 12 students.

+ **Experimental group:** 12 students.

The experimental period is 04 months, corresponding to 1 semester, the exercises are conducted during extracurricular hours, the duration is 2 sessions / week, the experimental time is 45 minutes/session. During the experiment, both groups participated in the same amount of extracurricular exercise. The comparison group did not apply the selected exercises, while the experimental group applied the exercises selected by the research topic.

### Mathematical statistical Methods

We use SPSS software version 20 to analyze and process data collected during the research process of the project.

### Research Results and Discussion

#### 1. Selecting exercises to assess strength and speed for male badminton students in the Faculty of Physical Education and Sports, Thai Nguyen University of Education, Thai Nguyen University

Based on the theoretical basis and principles of exercise selection, the project initially synthesized 22 specialized exercises to improve speed power for male badminton students of the Faculty of Physical Education and Sports, Thai Nguyen University of Education, Thai Nguyen University. During the research process, we developed an interview questionnaire and interviewed twice with 32 experts, coaches, and teachers with experience in teaching and coaching badminton to identify exercises to improve the quality of speed power for male students. The interview process is carried out equally and 30 days apart in the form of electronic interviews (each session lasts 7 days). Answer options are divided into score levels according to the Likert scale as follows:

1. Strongly disagree (1 point).
2. Disagree (2 points).
3. Normal (3 points).
4. Agree (4 points).
5. Strongly agree (5 points).

The results were 12 exercises with a selection rate of over 80%, specifically in Table 1:

**Table 1:** Results of interviews with experts on exercises to assess speed power for male badminton students at the Faculty of Physical Education and Sports, Thai Nguyen University of Education, Thai Nguyen University ( $n_1=n_2=32$ )

TT	Test	Round 1		Round 2		$\chi^2$	P
		$\sum_{point}$	%	$\sum_{point}$	%		
1.	Move horizontally 2 single yard steps 10 times (s)	146	91.25	151	94.37	0.13	>0.05
2.	Move 1 - 2 steps on both sides to hit the shuttlecock quickly 5 times (s)	120	75.00	123	76.88	0.55	>0.05
3.	Move up to 2 corners of the net and hit the shuttlecock 10 times (without shuttlecock) (s)	118	73.75	124	77.50	0.53	>0.05
4.	Move forward and backward 5 times (s)	150	93.80	153	95.63	0.24	>0.05
5.	Move 1 step forward to simulate defending right and backhand, then 2 steps back, jump and hit the shuttlecock 5 times (s)	151	94.37	155	96.88	0.37	>0.05
6.	Move and hit the shuttlecock at 2 corners of the net 10 times (s)	117	73.12	125	78.12	0.12	>0.05
7.	Move back 2 steps, jump and hit the shuttlecock 5 times (s)	152	95.00	155	96.88	0.21	>0.05
8.	Coordinate moving and hitting the shuttlecock at the last 2 corners of the court 5 times (s)	119	74.38	123	76.88	0.42	>0.05
9.	Move horizontally to simulate defending on both sides 5 times (s)	145	90.63	151	94.37	0.34	>0.05
10.	Move and pick up the shuttlecock from 4 corners of the court 5 times (s)	118	73.75	124	77.50	0.54	>0.05
11.	Move 6 corners of the court 5 times (s)	144	90.00	150	93.80	0.32	>0.05
12.	Move and push the shuttlecock at 6 corners of the court 2 times (s)	145	90.63	151	94.37	0.28	>0.05
13.	Single jump rope (s)	120	75.00	122	76.25	0.79	>0.05
14.	Move from the middle of the court back to the back of the court to hit the high shuttlecock and then move back to the middle of the court 5 times (s)	150	93.80	151	94.37	0.35	>0.05
15.	Move forward to the net to drop the shuttlecock and move back to the end of the court to hit the shuttlecock 5 times (s)	145	90.63	155	96.88	0.14	>0.05
16.	Move up to 2 corners of the net to hit the shuttlecock (without shuttlecock)	118	73.75	124	77.50	0.16	>0.05
17.	Move and hit the shuttlecock at 4 corners of the court 5 times (s)	152	95.00	155	96.88	0.98	>0.05
18.	Hit the high shuttlecock continuously with a partner 20 times (s)	120	75.00	123	76.88	0.76	>0.05
19.	Stand in place and hit the high shuttlecock against the wall for 30 seconds (number of times)	123	76.88	124	77.50	0.54	>0.05
20.	30-m sprint (s)	145	90.63	153	95.63	0.56	>0.05
21.	On the spot, jump and hit the shuttlecock continuously for 30 seconds (number of times)	120	75.00	123	76.88	0.48	>0.05
22.	Move horizontally and hit right and backhand 10 times (s)	145	90.63	151	94.37	0.73	>0.05

The results obtained after 2 interviews in table 2 show: The results of 2 interviews of the tests all have  $\chi^2_{result} < \chi^2_{table}$  at  $p > 0.05$ , so the difference between the two observed values

is of the sample is not meaningful. In other words, the results of the two interviews were statistically consistent.

In order to ensure the value of expert opinions, the study decided to select tests with opinions  $\sum_{point} \geq 130$  and

interview participation rate  $\geq 80\%$ . The results obtained were the following 06 tests: 1) Move horizontally 2 single yard steps 10 times (s); 2) Move forward and backward 5 times (s); 3) Move 1 step forward to simulate defending right and backhand, then 2 steps back, jump and hit the shuttlecock 5 times (s); 4) Move back 2 steps, jump and hit the shuttlecock 5 times (s); 5) Move horizontally to simulate defending on both sides 5 times (s); 6) Move 6 corners of the court 5 times (s); 7) Move and push the shuttlecock at 6 corners of the court 2 times (s); 8) Move from the middle of the court back to the back of the court to hit the high shuttlecock and then move back to the middle of the court 5 times(s); 9) Move forward to the net to drop the shuttlecock and move back to the end of the court to hit the shuttlecock

5 times(s); 10) Move and hit the shuttlecock at 4 corners of the court 5 times (s); 11) 30-m sprint (s); 12) Move horizontally and hit right and backhand 10 times (s).

## 2. Evaluating the effectiveness of exercises to improve strength and speed for male badminton students of the Faculty of Physical Education and Sports, Thai Nguyen University of Education, Thai Nguyen University

### 1. Evaluate effectiveness before experiment

Before the experiment, we tested the speed power of male students in the comparison group and the experimental group. The grouping results are completely objective, the results are in table 2.

**Table 2:** Results of testing exercises to assess speed spower of the comparison group and the experimental group before the experiment

TT	Test	Comparison Group		Experimental Group		t	P
		$\bar{X}_A$	$\pm \delta$	$\bar{X}_B$	$\pm \delta$		
1.	Move horizontally 2 single yard steps 10 times	23.05	0.78	23.22	0.76	1.895	>0.05
2.	Move forward and backward 5 times (s)	18.58	0.92	19.01	0.78	1.408	>0.05
3.	Move 1 step forward to simulate defending right and backhand, then 2 steps back, jump and hit the shuttlecock 5 times (s)	19.32	0.52	19.33	0.55	0.912	>0.05
4.	Move back 2 steps, jump and hit the shuttlecock 5 times (s)	15.45	0.45	15.50	0.34	1.756	>0.05
5.	Move horizontally to simulate defending on both sides 5 times (s)	20.12	1.67	20.14	1.52	1.239	>0.05
6.	Move 6 corners of the court 5 times (s)	26.65	2.01	27.02	2.03	1.604	>0.05
7.	Move and push the shuttlecock at 6 corners of the court 2 times (s)	28.78	3.06	28.80	2.98	1.902	
8.	Move from the middle of the court back to the back of the court to hit the high shuttlecock and then move back to the middle of the court 5 times (s)	22.34	2.76	22.46	2.65	1.245	>0.05
9.	Move forward to the net to drop the shuttlecock and move back to the end of the court to hit the shuttlecock 5 times (s)	25.12	2.92	25.15	2.89	1.683	>0.05
10.	Move and hit the shuttlecock at 4 corners of the court 5 times (s)	27.47	2.34	27.51	2.71	1.385	>0.05
11.	30-m sprint (s)	5.01	0.45	5.02	0.44	1.905	>0.05
12.	Move horizontally and hit right and backhand 10 times (s)	25.03	2.03	25.10	2.11	1.876	>0.05

From the results obtained in Table 2, it shows that the test results in the selected tests between the experimental and control groups have no difference. biệt  $t_{\text{result}} < t_{\text{table}}$  at probability threshold  $p > 0.05$ . This proves that, before conducting the experiment, the strength and speed of the two groups' footsteps were equal. This means that the grouping was random and the levels of both groups before

the experiment were equivalent with no statistically significant differences.

### 2. Results after 4 months of experiment

After a 4-month experimental period, we conducted a test to evaluate the speed power of the two control groups and the experimental group. The results are presented in table 3.

**Table 3:** Results of testing exercises to assess speed power of research subjects after 4 months of experiment

TT	Test	Comparison Group		Experimental Group		t	P
		$\bar{X}_A$	$\pm \delta$	$\bar{X}_B$	$\pm \delta$		
1.	Move horizontally 2 single yard steps 10 times	22.78	0.43	22.22	0.35	3.013	<0.05
2.	Move forward and backward 5 times (s)	18.21	0.56	18.00	0.22	2.595	<0.05
3.	Move 1 step forward to simulate defending right and backhand, then 2 steps back, jump and hit the shuttlecock 5 times (s)	19.02	0.31	18.88	0.29	2.540	<0.05
4.	Move back 2 steps, jump and hit the shuttlecock 5 times (s)	15.32	0.25	15.11	0.24	2.466	<0.05
5.	Move horizontally to simulate defending on both sides 5 times (s)	20.00	0.26	19.78	0.45	2.354	<0.05
6.	Move 6 corners of the court 5 times(s)	26.05	1.53	25.72	1.43	3.111	<0.05
7.	Move and push the shuttlecock at 6 corners of the court 2 times (s)	28.23	1.99	27.74	1.75	3.296	<0.05
8.	Move from the middle of the court back to the back of the Court to hit the high shuttlecock and then move back to the middle of the court 5 times (s)	22.13	1.57	21.91	1.49	2.781	<0.05
9.	Move forward to the net to drop the shuttlecock and move back to the end of the court to hit the shuttlecock 5 times (s)	24.67	1.03	24.15	1.11	2.562	<0.05
10.	Move and hit the shuttlecock at 4 corners of the court 5 times (s)	27.22	1.97	26.67	1.77	2.533	<0.05
11.	30-m sprint (s)	4.98	0.34	4.74	0.21	2.430	<0.05
12.	Move horizontally and hit right and backhand 10 times (s)	24.56	1.69	24.11	1.22	2.239	<0.05

From the results obtained in Table 3, it can be seen that the test results in the selection tests between the experimental and comparison groups were different. This proves that the strength of foot movement speed in the experimental group has developed much better than the comparison group, showing the  $t_{\text{result}} < t_{\text{table}}$  at the statistical probability threshold  $p < 0.05$ .

### Conclusion

The research process of the project has selected 12 specialized exercises to improve speed power for male badminton students of the Faculty of Physical Education and Sports, Thai Nguyen University of Education, Thai Nguyen University. Through a 4-month pedagogical experiment, the project has determined the clear effectiveness of the selected exercises in improving students' speed power. The performance of the experimental group was much higher than that of the comparison group in all exercises.

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