

Application of selected exercises to develop punching speed-strength for male athletes of the traditional martial arts team at Phu Yen University

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Summary: *Through a survey on the current training practices at several Vietnamese Traditional Martial Arts centers and teams, a number of exercises aimed at developing punching speed-strength were identified. From this basis, selected exercises were applied to enhance punching speed-strength for male athletes of the Traditional Martial Arts Team at Phu Yen University.*

Keywords: *Speed-strength, Vietnamese Traditional Martial Arts, Phu Yen University,...*

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I. INTRODUCTION:

Vietnamese Traditional Martial Arts are ancient combat disciplines that have developed over centuries, reflecting the cultural quintessence, indomitable spirit, and martial ethos of the Vietnamese people.. Over time, Vietnamese Traditional Martial Arts have continuously evolved, been refined, and promoted globally. The Traditional Martial Arts Club at Phu Yen University was established in 2009. By the 2018–2019 academic year, the university integrated Traditional Martial Arts into its Physical Education curriculum as an elective course. This not only brought a refreshing atmosphere to the classroom but also helped students learn self-defense and gain insights into the history and techniques of this cultural martial art. Annually, the Phu Yen University Traditional Martial Arts Team participates in provincial-level competitions and has brought home many medals for the university.

One of the key components of physical conditioning is developing strength and speed in athletes. In reality, many athletes of the university's Traditional Martial Arts Team lack the endurance to maintain performance in the final rounds of competition and are often outperformed by opponents in terms of strength and speed, especially in delivering punches. Based on these reasons, and with a desire to contribute meaningfully to the training process and improve athletic performance for the Traditional Martial Arts Team at Phu Yen University, I have boldly chosen the topic: " *Research on the Application of Selected Exercises to Develop Punching Speed-Strength for Male Athletes of the Traditional Martial Arts Team at Phu Yen University*".

Research methods: Interview method, method of analyzing and synthesizing relevant documents, Pedagogical testing method, Pedagogical experiment method and Statistical mathematics method.

II. RESEARCH RESULTS:

2.1 Study and Application of Selected Exercises to Develop Punching Speed-Strength for Male Athletes of the Traditional Martial Arts Team at Phu Yen University

To select exercises for developing punching speed-strength for male athletes of the Traditional Martial Arts Team at Phu Yen University, the following steps were taken:

Step 1: Apply the method of reviewing existing literature.

Step 2: Investigate the current state of applying punching speed-strength development exercises in training at several Vietnamese Traditional Martial Arts centers and teams.

Step 3: Design a questionnaire.

Based on literature review and actual training practices, 32 supporting exercises aimed at developing punching speed-strength were initially compiled and categorized into:

- 11 general speed-strength development exercises
- 21 sport-specific speed-strength development exercises

Step 4: Conduct expert interviews.

The selected 32 exercises were then evaluated through interviews with coaches, referees, lecturers, students majoring in physical education, and some martial arts experts. Interviewees were asked to assess the importance and priority of each exercise in developing punching speed-strength for male athletes of the Traditional Martial Arts Team at Phu Yen University. The interviews were conducted twice with the same subjects at different times. An exercise was retained if it scored 70% or higher of the maximum possible points, with scoring as follows:

- Frequently used: 3 points
- Occasionally used: 2 points
- Rarely used: 1 point

Across both interview rounds, a total of 62 opinions were gathered:

- 8 from lecturers (12.9%)
- 15 from coaches (24.19%)
- 19 from referees (30.65%)
- 20 from students majoring in the field (32.26%)

Step 5: Selection of exercises based on expert feedback.

Based on the principle of selecting indicators that scored $\geq 70\%$ in both rounds of interviews, 15 exercises were identified, including:

- 5 general speed-strength exercises
- 10 sport-specific speed-strength exercises

To verify consistency between the two rounds of interviews, the Wilcoxon signed-rank test was applied to the components of punching speed-strength. The results are shown in Table 1:

Table 1. The Wilcoxon index value through 2 interviews

No.	Exercise Type	W_calculated	W_critical
1	General Speed-Strength	26	17
2	Sport-Specific	97	78

As seen in Table 1, at the 0.05 significance level, $W_{\text{calculated}} > W_{\text{critical}}$ indicates that the differences are not statistically significant ($P > 0.05$). In other words, the responses across both interview rounds were consistent, with no significant variation. Specific results for each indicator are detailed in Table 3.2.

Table 2. Summary of Expert Opinions from Two Rounds of Interviews on Exercises to Develop Punching Speed-Strength for Male Athletes of the Traditional Martial Arts Team at Phu Yen University

No.	Exercise Group	Exercise Description	Round 1 Score	Round 1 (%)	Round 2 Score	Round 2 (%)
1	General	Speed rope skipping, 30s \times 3 sets	87	90.06%	83	92.22%
2	General	Standing horizontal barbell snatch (20kg), 10s \times 4 sets	83	86.46%	78	86.67%
3	General	Prone position speed push-ups, 15s \times 3 sets	90	93.75%	82	91.11%
4	General	Speed climbing rope drill, 15s \times 3 sets	57	59.38%	53	58.89%

No.	Exercise Group	Exercise Description	Round 1 Score	Round 1 (%)	Round 2 Score	Round 2 (%)
5	General	Wheelbarrow push, 10m × 4 reps × 2 sets	59	61.46%	56	62.22%
6	General	Fast pull-ups on single bar, 15s × 3 sets	92	95.83%	88	97.78%
7	General	Supine speed bench press (20kg), 15s × 3 sets	66	68.75%	60	66.67%
8	General	Fast bicep curls with 2kg dumbbells, 15s × 3 sets	63	65.63%	57	63.33%
9	General	Seated speed dumbbell press (20kg), 15s × 3 sets	66	68.75%	61	67.78%
10	General	Bent-over rowing (20kg), 15s × 3 sets	85	88.54%	80	88.89%
11	General	Seated row (20kg), 15s × 3 sets	64	66.67%	56	62.22%
12	Specific	Stationary straight punch with 1kg dumbbells, both hands, 15s × 3 sets	93	96.88%	88	97.78%
13	Specific	Stationary uppercut punch with 1kg dumbbells, both hands, 15s × 3 sets	91	94.79%	86	95.56%
14	Specific	Stationary hook punch with 1kg dumbbells, both hands, 15s × 3 sets	87	90.06%	83	92.22%
15	Specific	Straight punches into lamp post, both hands, 15s × 3 sets	95	98.96%	89	98.89%

Table 2 shows: The results of interviews with experts indicate a consensus in the responses from the two rounds of interviews. The criteria that were highly rated in the first round were also highly rated in the second round, and those that were rated low in the first round were also not favored in the second round.

According to the principle of selecting criteria that achieved a score of $\geq 70\%$ in both rounds of interviews (meaning they account for 2/3 of the responses), only 15 exercises met the criteria with scores of $\geq 70\%$ of the maximum points, qualifying for selection.

Step 6: Implementation of the Training Program

Based on the research steps above, we proceeded to implement the selected supplementary exercises for developing punching speed-strength in the experimental group (Group B). The purpose was to enhance punching speed-strength and assess the effectiveness of these exercises. The training regimen included the following 15 exercises:

1. Speed rope skipping – 30s × 3 sets (30s rest between sets)
2. Stationary horizontal barbell snatch (20kg) – 10s × 4 sets (30s rest)
3. Prone speed push-ups – 15s × 3 sets (30s rest)
4. Fast pull-ups on the horizontal bar – 15s × 3 sets (30s rest)
5. Bent-over row with barbell (20kg) – 15s × 3 sets (30s rest)
6. Stationary straight punch with 1kg dumbbells (both hands) – 15s × 3 sets (30s rest)
7. Stationary uppercut punch with 1kg dumbbells (both hands) – 15s × 3 sets (30s rest)
8. Stationary hook punch with 1kg dumbbells (both hands) – 15s × 3 sets (30s rest)
9. Stationary straight punch into lamp post – 15s × 4 sets (30s rest)
10. Stationary uppercut punch into lamp post – 15s × 4 sets (30s rest)
11. Stationary hook punch into lamp post – 15s × 4 sets (30s rest)
12. Movement with a combination of 3 free punching techniques to surprise target – 30s × 3 sets (30s rest)
13. Punching heavy bag with combination of 3 free techniques – 30s × 3 sets (30s rest)
14. Stationary resistance band straight punches with both hands – 15s × 4 sets (30s rest)
15. Speed straight punch into medicine ball with both hands – 15s × 4 sets (30s rest)

2.2 Evaluation of the Effectiveness of Applying Selected Exercises to Develop Punching Speed-Strength for Male Athletes of the Traditional Martial Arts Team at Phu Yen University

To assess the effectiveness of applying selected punching speed-strength development exercises for male athletes, we carried out the following steps:

Step 1: Selection of Evaluation Tests for Punching Speed-Strength Four tests were chosen to evaluate punching speed-strength in athletes:

1. Arm strength test using a handgrip dynamometer (kg)
2. Speed push-up test in prone position – number of reps in 15 seconds
3. Straight punching speed test (both hands) – number of punches in 10 seconds
4. Medicine ball throw (5kg) – measured distance (m)

Step 2: Pre-Experiment Testing

To determine the initial status of punching speed-strength, we conducted tests with both the control and experimental groups before the intervention. The results are summarized in Table 3.

Table 3: Pre-Experiment Testing Results

TT	Test Item		Group (A)			Group (B)			t
			\bar{X}	δ	Cv (%)	\bar{X}	δ	Cv (%)	
1	Handgrip Strength (kg)	dominant hand	48.5	3.72	7.67	49.1	4.25	8.66	0.32
		non-dominant hand	43.4	2.59	5.97	43.6	2.12	4.86	0.18
2	Push-up Speed 15s (Time)		25.6	1.43	5.59	25.9	1.29	4.98	0.47
3	Straight Punch Speed 10s (Time)		77.9	1.37	1.76	78.2	1.87	2.39	0.39
4	Medicine Ball Throw 5kg (m)	dominant hand	7.36	0.66	8.97	7.41	0.65	8.77	0.16
		non-dominant hand	6.37	0.47	7.38	6.35	0.54	8.50	0.08

The data shows:

Overall, across all four evaluation tests, there were no statistically significant differences between the control and experimental groups prior to the intervention. This confirms that the grouping was random and the initial punching speed-strength levels were equivalent.

Step 3: Conducting the Training Intervention

Based on these results, we implemented the selected training program for the experimental group (Group B) over a 12-week period. The distribution of the training phases is shown in Table 4.

Table 4: Training Program Structure

Week	1		2	3	4	5	6	7	8	9	10	11	12
Phase		Preparation						Specific Preparation				Second Data Collection and Evaluation of Training Outcomes	
Training		Anatomical Adaptation			Maximum Strengt			Speed-Strength		Maintenance of Speed-Strength and Specific Fitness			

Step 4: Post-Experiment Testing and Evaluation

After three months of implementation, we conducted post-intervention testing for both groups using the same set of four tests. The results were used to evaluate the effectiveness of the training program. The findings are presented in Table 5.

Table 5: Summary of Performance Development in Control Group (A) and Experimental Group (B)

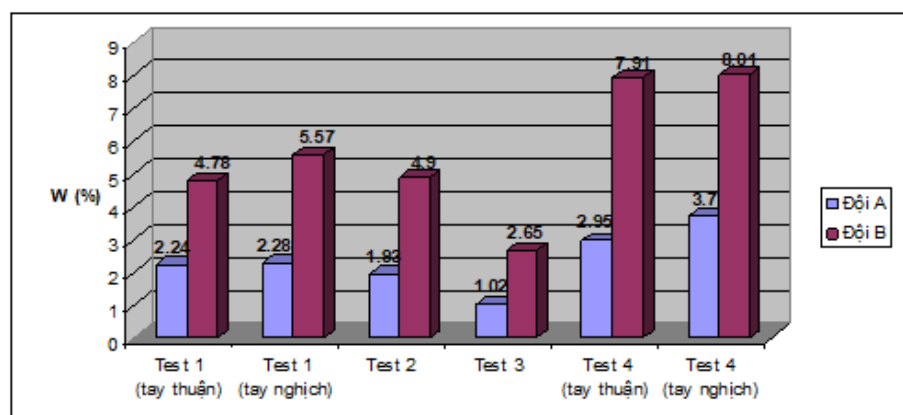
Test	Group A (Control)	Group B (Experimental)
	Before	After
Test 1 – Handgrip Strength (Dominant arm)	48.5	49.6
Test 1 – Handgrip Strength (Non-dominant)	43.4	44.4
Test 2 – Speed Push-Ups (15s)	25.6	26.1
Test 3 – Straight Punches (10s)	77.9	78.7
Test 4 – 5kg Medicine Ball Throw (Dominant arm)	7.36	7.58
Test 4 – 5kg Medicine Ball Throw (Non-dominant arm)	6.37	6.61

From Table 5, we observe:

- After 3 months, the experimental group showed statistically significant improvements in all indicators related to punching speed-strength (at $p < 0.05$).
- The improvements in the experimental group were notably higher than those of the control group.
- This demonstrates the positive and systematic impact of the selected exercises on the development of punching speed-strength.

The strength of the correlations among the evaluation tests further confirms the training's effectiveness. The progression is also clearly illustrated in the following chart:

Figure 1: Punching Speed-Strength Development of the Two Groups



The chart shows that the rate of improvement in Group B (experimental) was significantly higher than in Group A (control), highlighting the effectiveness and suitability of the training program for developing punching speed-strength in the experimental group.

III. CONCLUSION

1. The study successfully identified **15 exercises** for developing punching speed-strength in male athletes of the Traditional Martial Arts Team at Phu Yen University, comprising:
 - **5 general speed-strength development exercises**

○ **10 sport-specific speed-strength development exercises**

2. Through the experiments conducted on the male athletes of the Traditional Martial Arts Team at Phu Yen University after 3 months, the results obtained show that the speed strength of the experimental group is better than that of the control group, as reflected in the testing indicators: the highest growth rate for group B (experimental) is 8.01%, the lowest is 2.65%; while for group A (control), the highest is 3.70%, and the lowest is 1.02%.
3. All tests showed high growth value after 3 months of experimentation, and this growth indicates that the training program for strength and speed development exercises for male athletes of the Traditional Martial Arts Team at Phu Yen University is completely reasonable and suitable for the target group..

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