

SELECTING AND EVALUATING THE EXERCISE EFFECTIVENESS TO ENHANCE GENERAL FITNESS AMONG MALE STUDENTS AT THE UNIVERSITY OF DA NANG

Nguyen Ngoc Quynh Dung⁽¹⁾; Nguyen Huu Luc⁽¹⁾

Summary

Using regular scientific research methods, this study selected and evaluated the effectiveness of 51 physical exercises. The results demonstrated their impact on improving the overall fitness of male students at the University of Da Nang after a period of pedagogical experimentation.

Keywords: Physical fitness, fitness exercises, male students, University of Da Nang.

INTRODUCTION

The development of physical fitness among students at universities, colleges, and vocational training institutions is essential to their overall education and training. The University of Da Nang is a multidisciplinary institution comprising 11 member units, with an annual admission of approximately 13,000 students. Therefore, the task of Physical Education is one of the central goals, contributing significantly to the holistic development of students. However, recent monitoring of students' physical fitness has shown that a low percentage meet the required fitness standards, which has a substantial impact on the objectives of the Physical Education curriculum. Consequently, evaluating the current state of student fitness and identifying the factors that affect it are urgent tasks for the Faculty of Physical Education at the University of Da Nang in the current context. Based on this, we conducted a study aimed at applying specific exercises to enhance the physical fitness of male students at the University of Da Nang.

RESEARCH METHODS

In this study, the following methods were employed: document analysis and synthesis, interviews and group discussions, pedagogical testing, and statistical analysis. The experiment was carried out with a sample of 81 male students from the University of Da Nang. Of these, 50 students were assigned to an experimental group, where they participated in

both curricular and extracurricular physical exercise programs, while 31 students formed the control group, following the regular Physical Education curriculum during the 2020-2021 academic year.

RESULTS AND DISCUSSION

1. Selecting the physical fitness exercises for male students at the University of Da Nang

Based on the scientific basis and practical teaching experience in Physical Education for students at the University of Da Nang, we conducted pedagogical observations, reviewed relevant documents, and interviewed 25 experts in the field of sports. As a result, we identified 51 appropriate fitness exercises, divided into 7 groups. Below is the list of exercises with specific guidelines on volume, intensity, and rest periods between exercises:

1. Strength exercises: plank, sit-ups, leg raises, lunges, bodyweight squats, reverse crunches, heel touches, squat jumps, wall sits, lateral lunges. Execution: 3-4 sets, 10-20 repetitions per set, rest 30-45 seconds between sets.

2. Push-up exercises: standard push-ups, incline push-ups, elevated leg push-ups. Execution: 3-4 sets, 10-15 repetitions per set, rest 30-45 seconds between sets.

3. Plyometric (Jumping) Exercises: knee tucks, standing broad jumps, mountain climbers. Execution: 3-4 sets, 8-20 repetitions per set, rest 30-45 seconds between sets.

4. Speed exercises: 20-meter sprints, 30-meter sprints, high knee running in place, heel

⁽¹⁾Master, Faculty of Physical Education, University of Da Nang

kicks in place. Execution: 4-5 sprints at maximum effort or 3-4 sets, rest 30 seconds to 1 minute between sets.

5. Endurance exercises: 5-minute running in place, mountain climbers, 10-minute endurance run, squat jumps, side planks. Execution: 3-4 sets, 10 repetitions per set or 5-15 minutes of continuous exercise, rest 30 seconds to 2 minutes.

6. Flexibility and stretching exercises: straight leg raises, scissor kicks, superman pose, shoulder rotations, hip flexor stretch, hamstring stretch. Execution: 3-4 sets, 12-20 repetitions per set, or hold for 30 seconds, rest 30 seconds between sets.

7. Cardio and coordination exercises: quick lateral steps, burpees, lateral jumps, jumping jacks, forward leg kicks, single-leg squats, spider climbs, standing broad jumps, crossover jumps, backward leg kicks, single-leg squat jumps, twisting jumps, foot slides, side planks, squats, forward bends, wall climbs, on-the-spot jumps, incline push-ups, explosive jumps. Execution: 3-4 sets, 10-20 repetitions per set, or 30 seconds per set, rest 30-45 seconds.

2. Applying and evaluating the effectiveness of selected exercises to enhance general fitness in male students at the University of Da Nang

2.1. Development of the experimental plan

To design the experimental plan, we consulted with 25 instructors, experts, and coaches in the field of Physical Education through surveys. Additionally, we referenced relevant academic documents and adhered to the principles of Physical Education in formulating the plan, as follows:

- Duration of the experiment: Conducted over two academic semesters in the 2020–2021 school year, each semester lasting 15 weeks. The experiment was implemented during regular and extracurricular training sessions, from September 2020 to May 2021.

- Number of training sessions: Each semester comprised 45 sessions, with 3 sessions per week. Thus, the experimental program spanned 90 training sessions over one academic year.

- Experimental subjects: The experiment was

conducted on first-year male students from member units of the University of Da Nang. The control group consisted of 31 male students who followed the current curriculum of the Faculty of Physical Education, while the experimental group included 50 male students who practiced the 51 selected fitness exercises.

- Progress of the Experiment: Exercise arrangement: Each session lasted from 60 to 90 minutes, with a focus on developing weaker fitness elements. Each session concentrated on 1-2 fitness components, combining appropriate exercises from the 7 exercise groups. Training progression 45 sessions/semester: During the first 4 weeks of each semester, the focus was on strength and endurance exercises, along with flexibility and stretching exercises. From weeks 5 to 10, speed and plyometric exercises were added to enhance reflexes and explosiveness. The last 5 weeks prioritized coordination and cardio exercises to optimize overall fitness.

- Session Structure: Warm-up: 10-15 minutes focusing on flexibility and stretching exercises. Main Training: 40-60 minutes, depending on the intensity of the session. Each session focused on 1-2 exercise groups with a variety of exercises. For example, a strength-focused session included exercises such as squats, push-ups, and planks. Cooldown: The last 10-15 minutes were dedicated to stretching and relaxation exercises.

- Training method: The experiment employed various methods of Physical Education, such as regulated training, game-based activities, and competitive exercises. The selected exercises were designed according to the principle of progressively increasing the intensity to ensure both effectiveness and safety.

- Criteria for evaluating effectiveness: To assess the effectiveness of the selected exercises, we measured the fitness levels of both groups before and after the experiment, using general fitness criteria according to Decision No. 53/2008/QĐ-BGDĐT.

2.2. Application results

2.2.1. Pre-experiment testing results for both groups

To ensure objectivity in group assignment, we compared the test results t-student between

the experimental group (n = 50) and the control group (n = 31) at the beginning of the first semester of the 2020–2021 academic year. The tests included a standing long jump, a 30-meter

sprint with a high start, a 4 x 10-meter shuttle run, and a 5-minute endurance run. The comparison results are as follows (Table 1):

Table 1. Comparison of physical fitness between the experimental and control groups before the experiment

No	Test Components	Control Group (n = 31)	CV%	Experimental Group (n = 50)	CV%	t	p
1	Standing long jump (cm)	198.7 ± 20.7	10.46	202.8 ± 18.3	10.92	1.76	> 0.05
2	30m sprint with a high start (s)	6.62 ± 0.88	13.6	6.87 ± 1.33	12.3	1.63	> 0.05
3	4 x 10m shuttle run (s)	13.49 ± 0.67	5.4	13.54 ± 0.57	4.51	0.43	> 0.05
4	5-minute endurance run (m)	840.7 ± 152.5	18.13	858.2 ± 140.6	16.4	0.68	> 0.05

The results presented in Table 1 indicate that the mean values of all five tests for both groups did not show statistically significant differences (p > 0.05). The values of t ranged from 0.43 to 1.76, smaller than t-table = 1.98. It confirms that the grouping was random and objective. The coefficient of variation (CV%) for each test was relatively similar across the two groups (either > 10% or < 10%, depending on the fitness component being tested), suggesting comparable variability within each group. Thus, the pre-experiment results demonstrate no significant differences between the experimental

and control groups, affirming the randomness and objectivity of the grouping. This provides a strong foundation for the subsequent experimental phase.

2.2.2. Post-experiment testing results for both groups

After completing 90 experimental sessions over two semesters, we conducted physical fitness tests for both the control group and the experimental group, following the standardized tests prescribed by the Ministry of Education and Training. The results are detailed in Table 2 below:

Table 2. Comparison of physical fitness between the control and experimental groups after the experiment

Test Components	Standard		Control Group (n = 31)		Experimental Group (n = 50)		Comparison	
	Good	Satisfied	±δ	Evaluation	±δ	Evaluation	t	P
Standing long jump (cm)	>225	≥207	208.2 ± 20.1	Satisfied	249.2 ± 22.3	Good	3.42	<0.01
30m sprint with high start (s)	<4.70	≤5.70	5.7 ± 0.44	Satisfied	5.6 ± 0.43	Satisfied	2.06	<0.05
4 x 10m shuttle run (s)	<11.75	≤12.40	12.61 ± 1.33	Unsatisfied	11.64 ± 1.24	Good	2.96	<0.01
5-minute endurance run (m)	>1060	≥950	903.5 ± 106.7	Unsatisfied	1032.8 ± 80.6	Satisfied	3.27	<0.01



The results from Table 2 reveal that the experimental group consistently outperformed the control group in all physical fitness tests. Statistically significant differences were observed, with $p < 0.05$ and $p < 0.01$ values across different tests. Specifically: Standing long jump test: The experimental group's result is "Good" with a mean of 249.2 cm, significantly higher than the control group's result - Satisfied (208.2 cm) ($t = 3.42$, $p < 0.01$). 30m sprint with high start: Both groups satisfied the standard, but the experimental group slightly improved over the control group ($t = 2.06$, $p < 0.05$). 4 x 10m shuttle run: The experimental group's result is "Good" with a time of 11.64 seconds, while the control group did not meet the standard with a time of 12.61 seconds ($t = 2.96$, $p < 0.01$). 5-minute endurance run test: The experimental group satisfied the standard with a mean distance of 1032.8 meters, outperforming the control group, which did not meet the standard with 903.5 meters ($t = 3.27$, $p < 0.01$).

Regarding the physical growth rate, we analyzed the physical growth rate of both groups after each semester, with the results presented in Table 3.

The results in Table 3 indicate that the experimental group showed a significantly higher growth rate in physical fitness compared to the control group across all test components, particularly in the standing long jump and the 5-minute endurance run. This improvement

underscores the effectiveness of the physical exercises designed for the experimental group.

Comparison with the Ministry of Education and Training Standards: Table 4 compares the percentage of students who met the physical fitness standards between the control and experimental groups, using the evaluation criteria set by the Ministry of Education and Training.

The results in Table 4 demonstrate that the number of students in the experimental group, who met the physical fitness standards of the Ministry of Education and Training, significantly exceeded those in the control group. This finding once again highlights the effectiveness of the physical exercises implemented during the experiment.

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CONCLUSION

The physical fitness of male students at the University of Da Nang remains limited, as reflected by the low number of students meeting the fitness standards set by the Ministry of Education and Training, particularly in general endurance. Through this research, a system of 51 physical exercises was selected and proven effective in improving the physical fitness of male students at the University of Da Nang after 90 sessions of pedagogical experimentation over two semesters of physical education classes. The research results are scientifically validated and feasible for practical application.

REFERENCES

1. Ministry of Education and Training (2008), Decision No. 53/2008/QĐ-BGDĐT dated September 18, 2008, issuing regulations on the evaluation and classification of student physical fitness.

Table 3. Comparison of physical growth rate between the control and experimental groups after the experiment

Test Components	Control Group (n = 31)					Experimental Group (n = 50)				
	TTN $\bar{x} \pm \delta$	STN1 $\bar{x} \pm \delta$	STN2 $\bar{x} \pm \delta$	W1	W2	TTN $\bar{x} \pm \delta$	STN1 $\bar{x} \pm \delta$	STN2 $\bar{x} \pm \delta$	W1	W2
Standing long jump (cm)	198.7 ± 20.7	204.5 ± 17.2	208.2 ± 20.1	2.9	4.7	202.8 ± 15.33	218.8 ± 15.33	249.2 ± 22.3	8.9	20.5
30m sprint with high start (s)	6.62 ± 0.88	6.23 ± 0.56	5.7 ± 0.44	6.1	14.9	6.87 ± 1.33	6.21 ± 1.33	5.6 ± 0.43	10.1	20.4
4 x 10m shuttle run (s)	13.49 ± 0.67	13.01 ± 1.27	12.61 ± 1.33	3.6	6.7	13.54 ± 0.57	12.54 ± 1.57	11.64 ± 1.24	7.7	15.1
5-minute endurance run (m)	840.7 ± 152.5	868.3 ± 96.7	903.5 ± 106.7	3.2	7.2	858.2 ± 140.6	929 ± 110.6	1032.8 ± 80.6	7.9	18.5

TTN: Pre-experiment, STN1: After 1 semester of experiment, STN2: After 2 semesters, of experiment, W1: Growth rate after 1 semester, W2: Growth rate after two semesters (compared to pre-experiment)

Table 4. Comparison of physical fitness test results between the control and experimental groups with the Ministry of Education and Training's standards

Test Components	Control Group (n = 31)					Experimental Group (n = 50)				
	T	%	Đ	%	KĐ	T	%	Đ	%	KĐ
Standing long jump (cm)	3	9.7	10	32	18	19	27	27	54	4
30m sprint with high start (s)	2	6.5	14	45	15	18	29	29	58	3
4 x 10m shuttle run (s)	2	6.5	17	55	12	19	27	27	54	4
5-minute endurance run (m)	1	3.2	11	35	19	17	28	28	56	5

T: Good, Đ: Satisfied, KĐ: Unsatisfied

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 Main responsible: Nguyen Ngoc Quynh Dung
 Email: dungquynhvn@gmail.com)