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Application of specialized exercises to improve fitness for students studying Karatedo elective physical education program at Ho Chi Minh City University of Technnology and Education, Vietnam

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Abstract

Through the assessment of the physical state of students participating in Karatedo under the elective physical education program at HCMC University of Technology and Education, the topic has selected 30 specialized exercises to improve students's fitness for the. After 15 weeks of study, the effectiveness of the program was evident through the level of satisfaction of students and lecturers directly involved. At the same time, the fitness growth rate of all 06 evaluation criterion of the male and female experimental groups was better than the male and female control groups respectively. It showed that the effectiveness and reasonableness of elective Karatedo module belonged to the physical education program at HCMC University of Technology and Education.

Keywords: Exercise, fitness, karatedo, physical education, students

Introduction

Ho Chi Minh City University of Technology and Education (HCMC UTE) is one of the universities that soon brought Karatedo into teaching as well as extra-curricular practice. In addition to the strong development of the overtime training movement, the effectiveness of teaching Karatedo at the school is still not satisfactory, the most obvious is the lack of improvement in the physical strength of students who have participated Karatedo module belonged to physical education course.

The characteristic of Karatedo is the practice of making the body parts of the trainee become agile and powerful [10]. Due to Karatedo playing for a short time, its attacks require the following characteristics: quickness to hit the opponent, strong enough to score and endurance to play full time, skill to good coordination of movements. In which strength and speed play an important role in training and competition. However, the final exam results often show that students who meet the subject requirements are not really confident and effective. This limitation is due to the lack of investment in exercises and tests to supplement the professional strength for learners [5].

Therefore, to contribute to the promotion of Karatedo learning outcomes, especially to improve the strength and fitness level of students, we are brave to study: "Application of specialized exercises help improve the physical strength for students to study Karatedo elective physical education program at Ho Chi Minh City University of Technology and Education, Vietnam ". This is an urgent and highly current issue to contribute to further improving the teaching and training of Karatedo here.

2. Object and research method

2.1. Research subjects

The object of the study is specialized exercises to help improve the physical strength for students studying the Karatedo elective physical education program.

2.2. Study participants

The study participants included 120 students aged 18-22 who studied optional elective

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physical education at the HCMC UTE, divided into two groups. The control group (60 students, including: 30 males and 30 females) participated in the Karatedo elective physical education program according to the old program at HCMC UTE; Experimental group (60 students, including: 30 males and 30 females) studying Karatedo elective according to the new program with selected exercises at HCMC UTE.

2.2. Proceed

Research experiments were conducted from June 2019 to May 2020 at HCMC UTE.

2.3. Method

Common methods used in carrying out research tasks include: Summary and analysis of relevant documents; Expert interview; Pedagogical examination; Pedagogical experiment; Statistics and calculations [8].

3. Research results

3.1. Selecting a number of specialized exercises to help improve the fitness for students studying physical education program with optional Karatedo module

By synthesizing and referring to professional sources as well as through the process of surveying the status of physical education for Karatedo elective students in provinces and cities throughout Vietnam, the topic collected 44 strength development exercises that have been commonly used in practice. However, because the use and method of using these exercises are still inadequate, inconsistent, lack of scientific and systematic, so it has not brought high effectiveness in Karatedo teaching.

Through researching on domestic and foreign power development documents of Lam Quang Thanh, Dang Ha Viet and Bui Trong Toai (2004), Siff, M. Y Verkhoshansky (2000), Tran Thi Van Khoan, together with topics on the quality of strength on reputable websites in the world, Scientific Journal of HCMC University of Sports, Scientific journal belonged to the Institute of Sports Sciences. the topic has reduced quantity of the Karatedo exercises. These exercises are based on the following criterion: Ensuring training equipment; Demonstrating diversity; Relating to muscle groups participating in Karatedo activities.

The topic also uses the classification of strength exercises based on the nature and characteristics of strength in Karate professional activities to develop interview cards (ankét).

To ensure the selection of exercises in a scientific, objective and accurate manner, we conducted interviews with 20 experts, coaches, lecturers and managers who are directly teaching and training Karatedo to select specialized exercises to help improve the fitness of students participating in Karatedo elective modules of the physical education program at HCMC UTE.

Through the interview results, the thesis has selected a system of 30 strength exercises (including 13 general strength exercises and 17 specialized strength exercises) to develop students's strength. As follows:

General strength exercises: 1. Plyometric tummy tuck; 2. Weightlifting jump; 3. Fold and stretch arms with the barbell; 4. Stand pushing weights up; 5. Weightlifting and spreading wide apart; 6. Mutant force with jumping from above 60cm and reflecting; 7. Turn on continuously with 2 legs and 1 leg; 8. Turn on high with knee lift; 9. Running thigh highs; 10. push-up; 11. Fold stomach; 12. Stretch back; 13. Turn on the platform 40cm high.

Professional strength exercises: 1. Standing and punching with hands; 2. Punching according to the signal; 3. Kick the

sphere under the signal; 4. Follow the signal to execute the rear arm and front leg; 5. Follow the signal for kicking the front leg and hitting the back arm; 6. Punch on target continuously; 7. Hit the target that appears suddenly; 8. Backhand attack continuously; 9. Hand grips and punches; 10. Kick Mawashi on target continuously; 11. Kick Mawashi on a moving target; 12. Move to attack with combination of 2 free techniques; 13. Kicking spherically with tied ankles; 14. Back up and counterattack; 15. One player compete to 5 players in turn; 16. Compete 1 point to win; 17. Exercising encroaching carpet to attack.

3.2. Application and evaluation of effective specialized exercises to improve fitness for students studying physical education program with elective Karatedo

3.2.1. Application of specialized exercises to improve fitness for students studying physical education program with elective Karatedo

Based on the timetable and study plan of physical education program with self-selected Karatedo subject at HCMC UTE, we have applied specialized exercises as following:

In order to achieve high results in training, the thesis has used the principles and methods of sports training processes in the experiment process [4, 6].

Control group (60 students including 30 males and 30 females) studying the Karatedo elective module according to the old program at HCMC UTE.

Experimental group (60 students including 30 men and 30 women): studying elective Karatedo module according to the new program (with specialized exercises to help improve students's fitness) at HCMC UTE.

Duration: 90 periods of 2 sessions per week, lasting for 15 weeks in a row, for the first term of the 2019-2020 school year.

Evaluation criterion: Applied according to the set of standards for assessing student's physical level (including 6 criterion) in 2008 of the Ministry of Education and Training, Vietnam.

3.2.2. Evaluate the application of selected Karatedo exercises through students's physical development

3.2.2.1. Assessing the general physical development of students participating in the elective Karatedo module at HCMC UTE

Female student groups

As shown in Table 1, pre-experiment period, the general fitness level of both female control group and female experimental group was similar. After applying the selected Karatedo exercises, the fitness of all two groups had t calculated $< t$ table at probability threshold of $P < 0.05 \sim 0.001$, the mean value difference is statistically significant. However, female experimental group's fitness developed better with 6 out of 6 criterion with $P < 0.001$. While the female control group had only 2 out of 6 criterion with $P < 0.05$ and 4 out of 6 criterion with $P < 0.01$.

It is more evident when comparing the growth rate between the female experimental group and the female control group at post-experiment period. The research results presented in Figure 1 show that, after one semester of practicing Karatedo physical exercises, both the female groups experienced physical growth at all indicators. But the control group's indicators of physical growth was not high ($W\% = 0.8 \sim 4.2$). Meanwhile, the female experimental group after applying the selected exercises had a remarkable increase in physical fitness ($W\% = 3.3 \sim 9.5$) compared to the female control group.

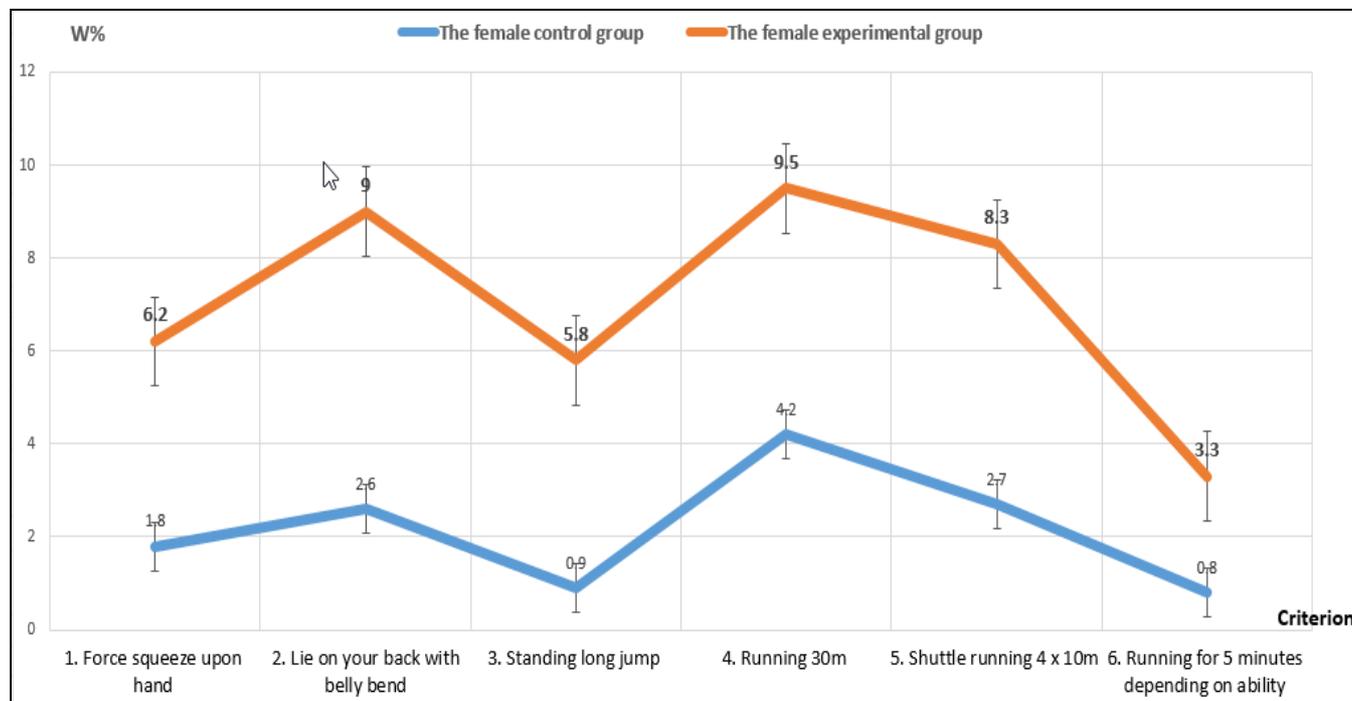


Fig 1: Comparison of growth rate between female experimental group and female control group after application of Karatedo exercises

Table 1. Comparison of physical development between female students of the control group and female students of the experimental group taking the elective Karatedo module at HCMC UTE

Criterion	The female control group (n=30)							The female experimental group (n=30)						
	\bar{X}_{CT1}	$\pm S_{CT1}$	\bar{X}_{CT2}	$\pm S_{CT2}$	W%	t	P	\bar{X}_{EP1}	$\pm S_{EP1}$	\bar{X}_{EP2}	$\pm S_{EPC2}$	W%	t	P
1. Force squeeze upon hand (KG)	27.61	1.60	28.12	1.75	1.8	2.174	<0.05	27.57	1.65	29.32	2.3	6.2	5.738	<0.001
2. Lie on your back with belly bend (times / 30s)	16.20	1.19	16.63	1.13	2.6	2.739	<0.05	16.27	1.14	17.8	1.67	9.0	6.073	<0.001
3. Standing long jump (cm)	154.63	4.11	156.03	3.53	0.9	3.363	<0.01	154.40	4.30	163.6	6.43	5.8	6.553	<0.001
4. Running 30m (s)	6.82	0.31	6.54	0.55	4.2	2.894	<0.01	6.76	0.34	6.15	0.53	9.5	5.477	<0.001
5. Shuttle running 4 x 10m (s)	13.15	0.20	12.8	0.72	2.7	2.861	<0.01	13.15	0.19	12.1	0.24	8.3	18.552	<0.001
6. Running for 5 minutes depending on ability (m)	888.97	33.58	896.4	34.92	0.8	3.088	<0.01	891.07	34.58	921.3	34.32	3.3	4.909	<0.001

Note: n-1 = 29, t_{0.05}=2.045, t_{0.01}=2.756, t_{0.001}=3.659

Table 2: Physical fitness ranking of female students participating in physical education program with the Karate elective module at HCMC UTE after the experimental period (according to the evaluation and grading standards of the Vietnamese Ministry of Education and Training 2008)

Criterion	The female experimental group (n=30)						The female control group (n=30)					
	Good		Fair		Fail		Good		Fair		Fail	
	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP
1. Force squeeze upon hand (KG)	0	8	20	22	10	0	0	2	20	23	10	5
2. Lie on your back with belly bend (times / 30s)	0	9	21	19	9	2	0	3	21	24	9	3
3. Standing long jump (cm)	0	14	20	15	10	1	0	1	20	24	10	5
4. Running 30m (s)	0	12	14	13	16	5	0	3	14	17	16	10
5. Shuttle running 4 x 10m (s)	0	16	6	14	24	0	0	4	6	14	24	12
6. Running for 5 minutes depending on ability (m)	0	13	22	17	8	0	0	5	22	23	8	2
Mean	0	12	17	17	13	1	0	3	17	21	13	6

Note: Pre-EP: Pre-Experiential Period; Post-EP: Post-Experiential Period

Table 3: Comparison of physical development between male students of the control group and male students of the experimental group taking the elective Karatedo module at HCMC UTE

Criterion	The female control group (n=30)							The female experimental group (n=30)						
	\bar{X}_{CT1}	$\pm S_{CT1}$	\bar{X}_{CT1}	$\pm S_{CT1}$	\bar{X}_{CT1}	$\pm S_{CT1}$	P	\bar{X}_{EP1}	$\pm S_{EP1}$	\bar{X}_{EP2}	$\pm S_{EPC2}$	W%	t	P
1. Force squeeze upon hand (KG)	40.44	1.53	41.78	2.88	3.3	2.749	<0.05	40.48	1.57	44.42	3.91	9.3	7.007	<0.001
2. Lie on your back with belly bend (times / 30s)	17.13	1.04	17.67	1.4	3.1	2.713	<0.05	17.07	1.17	20.27	3.33	17.1	5.410	<0.001
3. Standing long jump (cm)	208.67	4.39	212.8	7.62	2.0	2.996	<0.01	208.7	4.79	219.00	10.15	4.8	4.749	<0.001
4. Running 30m (s)	5.78	0.34	5.65	0.35	2.3	2.373	<0.05	5.73	0.34	5.24	0.64	8.9	4.880	<0.001
5. Shuttle running 4 x 10m (s)	12.16	0.18	12.05	0.28	0.9	2.620	<0.05	12.16	0.17	11.89	0.33	2.2	4.793	<0.001
6. Running for 5 minutes depending on ability (m)	948.4	33.72	976.03	50.75	2.9	3.142	<0.01	948.57	33.87	1009.00	60.80	6.2	4.997	<0.001

(Note: n-1 = 29, t_{0.05}=2.045, t_{0.01}=2.756, t_{0.001}=3.659)

Table 4: Physical fitness ranking of male students participating in physical education program with the Karate elective module at HCMC UTE after the experimental period (according to the evaluation and grading standards of the Vietnamese Ministry of Education and Training 2008)

Criterion	The female experimental group (n=30)						The female control group (n=30)					
	Good		Fair		Fail		Good		Fair		Fail	
	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP	Pre-EP	Post-EP
1. Force squeeze upon hand (KG)	0	16	20	14	10	0	0	5	20	23	10	2
2. Lie on your back with belly bend (times / 30s)	0	13	21	14	9	3	0	4	21	24	9	2
3. Standing long jump (cm)	0	14	20	15	10	1	0	1	20	24	10	5
4. Running 30m (s)	0	12	14	13	16	5	0	3	14	17	16	10
5. Shuttle running 4 x 10m (s)	0	16	6	14	24	0	0	4	6	14	24	12
6. Running for 5 minutes depending on ability (m)	0	15	22	15	8	0	0	6	22	20	8	4
Mean	0	14	17	14	13	2	0	4	17	20	13	6

Note: Pre-EP: Pre-Experiential Period; Post-EP: Post-Experiential Period

Male student groups

The research results presented in Table 2 show that, before applying the selected Karatedo exercises, the general fitness level of the male control group and the male experimental group was equivalent. At post-experimental period, the male experimental group's fitness developed better with 6 out of 6 criterion with $P < 0.001$, while the male control group's only had 4 out of 6 criterion with $P < 0.05$ and 2 out of 6 criterion with $P < 0.01$.

This is more evident when comparing the growth rate between the male experimental group and male control group after the experiment period. The research results presented in Figure 2 show that, after one semester of practicing Karatedo, both groups experienced physical growth at all indicators. However, after applying the selected exercises male experimental group had a remarkable increase in physical fitness ($W\% = 2.2 \sim 17.1$) compared to male control group ($W\% = 0.9 \sim 3.3$).

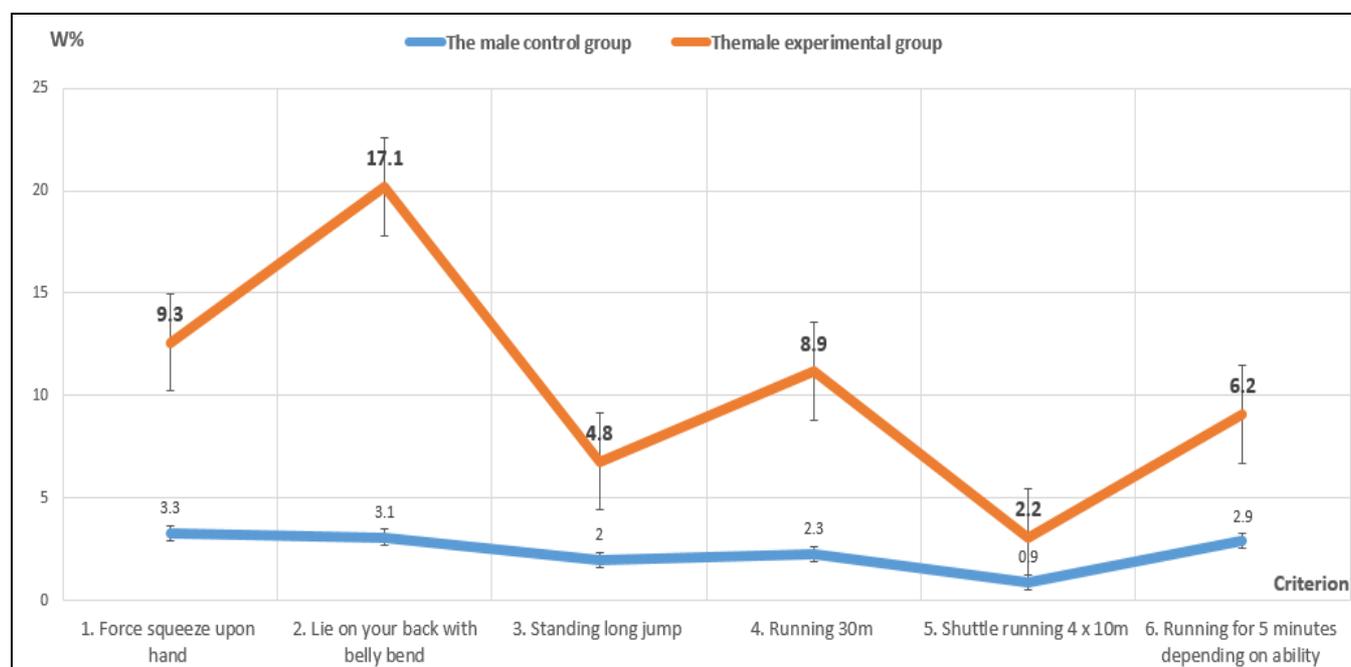


Fig 2: Comparison of growth rate between male experimental group and male control group after application of Karatedo exercises

Thus, it could be seen that, after the time of applying Karatedo exercises at HCMC UTE, students of male and female experimental groups had much better physical growth than those of control groups respectively, according to the criterion for evaluation and physical ranking of the Ministry of Education and Training, Vietnam (2008).

3.2.2.2. Fitness ranking of groups of students participating in the Karatedo elective physical education program at HCMC UTE after the time of experimenting according to the evaluation and physical fitness criteria of the Ministry of Education and Training, Vietnam (2008)

The results in Table 2, after the training time show: - In the female control group, out of the 6 criteria, the average number at "Good" increased from 0 to 3 students, at the "Fair"

increased from 17 to 21 students, and at "Fail" decreased from 13 to 6 students - In the female experimental group, out of the 6 criteria, the average number at "Good" increased from 0 to 12 students, at "Fair" was constant, and the number at the "Fail" level reduced from 13 to 1 student.

The result in Table 4, after training time have been noted that:

- In the male control group, out of 06 criterion, the average number at "Good" increased from 0 to 4 students, at "Fair" decreased from 20 to 17 students, and at "Fail" decreased from 13 to 6 students.
- In the male experimental group, out of the 6 test criterion, the average number at "Good" increased from 0 to 14, the number at "Fair" decreased from 17 to 14, and at "Fail" decreased from 13 to 2 students.

Thus, after studying physical education of Karatedo electives at HCMC UTE, students of both experimental groups of men and women both transformed their physical fitness better than students of the control groups corresponding to the standards. assess and rate the fitness of the Ministry of Education and Training, Vietnam (2008).

In summary, it could be affirmed that 30 Karatedo exercises to develop professional physical strength for learners are suitable and have brought practical results.

4. Conclusion

The thesis assessed the initial physical condition of male and female students in control and experimental groups participating in the Karatedo elective physical education program at HCMC UTE, which were basically similar.

Through expert opinion survey, we have selected 30 specialized Karatedo exercises; including 13 general strength exercises and 17 specialized strength exercises for practical application of Karatedo elective physical education program at HCMC UTE, Vietnam.

The effectiveness of the program has been clearly shown through: Satisfaction level of students and lecturers directly teaching Karatedo; Novelty and appeal of the program; The structure and distribution were suitable for students studying elective Karatedo module physical education program. After the application period, the rate of physical growth and fitness ranking of male and female experimental groups were better than those of male and female control groups, respectively, in all 06 comparison criterion. This proved the suitability and effectiveness of the 30 Karatedo exercises that the project has chosen to include in the physical education curriculum at HCMC UTE.

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