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Original Research Article

Evaluated the Quality of Physical Education Program – A Case Study for Male Students Participating in Basketball Course

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Abstract

The purpose of this study was to evaluate the application of a new basketball program for healthy male students at Saigon University when compared with the current basketball election classes in the physical education program. 64 healthy male students were chosen and randomly divided into two groups (experimental and control groups). All participants have experienced the 15-week training in basketball court at Saigon University every Wednesday morning. The results of the study indicated that a new basketball program had a positive improvement on speed, agility, power of leg, and maximum aerobic speed, except the core strength. Therefore, a new basketball program could facilitate greater enhancements, gave more benefits than the current program, created a healthy environment in studying physical education, and suited the enhancing training needs of male students at Saigon University. Future studies should be clarified the impact of that program for female students, for other types of sports, in line with the classification of participants, i.e., less exercise, long-term training, and high level in training of students.

Keywords: Basketball course, male students, physical education, 15-week training.

INTRODUCTION

The aim of physical education is not only to help students have a good physical body but also to develop their body strength, endurance, and skills relative to their age, sex, as well as to establish relationships among students (Kostenko, 2018; Brynzak *et al*., 2021). It is necessary to develop a good training program to keep athletes suited, motivated, and active. Therefore, the importance of developing good conditioning programs based on the specific physiological demands of each sport is considered a key factor to success (Taylor, 2003). Ziv & Lidor (2009) indicated some limitations of using a basketball program in training, i.e., lack of a longitudinal study, lack of examination tests in maximum exertion conditions, and lack of real-time movement study. Research in exercise science has provided guidelines for the development of a safe and efficient program to improve personal fitness (Hoeger & Hoeger, 2002). It is clear to tell the role of training programs in basketball nowadays.

Meanwhile, physical education (PE) courses are still heavily academic and have few course choices (Tuan, 2019). It is important to understand whether we should combine PE courses with higher intensity work-outs as in training program for competition and whether this approach can change the sports practice habits of students? According to Tuan *et al*. (2016), many difficulties in building a new training program for many purposes were due to the lack of specific facilities for training, lack of attention from the board of directors, lack of student reviews about the studied sport, and lack of qualified coaches. However, if this program is applied, students will have more time for practicing their favorite sport, which will give them more opportunities to enhance their fitness, improve their performance during their regular studying time, and create a healthy environment for training with more choices. In reality, many students need higher resistance training when studying physical education courses, i.e., the training plan before competition. Therefore, they could take less time to be ready before the competition was coming. A new basketball training program was applied to meet that requirement in physical education

course for male students at Saigon University, which was our rationale for this research.

MATERIALS AND METHODS

Subjects

The volunteer and selected subjects were 64 healthy male students, who attended the basketball elective courses in the physical education program at Saigon University. None of the participants had any physical problems, smoking, alcohol using or were taking any medication. All of the subjects joined the training in 15 weeks (equivalent to one semester). 32 students (experimental group) were chosen to take part in a new basketball program, the remaining 32 students (control group) participated in the current basketball course as in physical education program at Saigon University. They were informed of the test procedures before providing written consent. Besides, participants were recommended to continue their daily dietary and physical activity training throughout the study.

Procedures

Two weeks before, each participant answered a brief baseline questionnaire about their personal information and sport-related injury history (excluded if any problem occurred). One week after that, all participants came to examine their fitness before the physical education program began. 05 tests were used to evaluate the fitness as 30 seconds sit-up test (the core strength), 30m sprint test (speed), 4x10m Shuttle run test (agility), standing long jump test (the explosive power of the legs), and 5 minutes running field test (maximal aerobic speed-MAS). These tests were highly scientifically and reliable for the target groups of amateur players, students, and healthy people (Ministry of Education & Training, 2008). Besides, all tests were also suited to exam the fitness in basketball courses as physical education program at Saigon University (Tuan & Son, 2017). Then, all participants in two groups experienced the 15-week training (is described in Figure 1) with the same conditions as the time of studying, facility use, temperature, weather condition, etc.

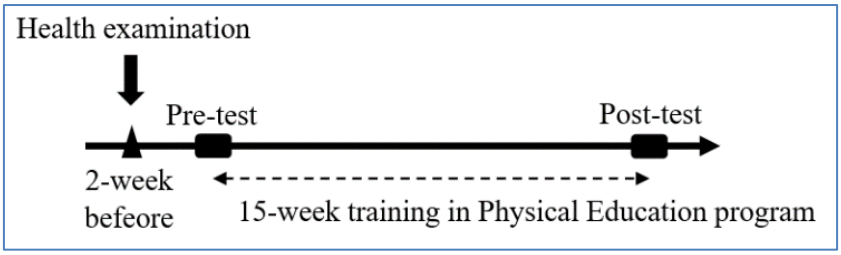

Fig-1: Research design of the study

The time for training was 9.00 to 10.40 am every Wednesday (once a week as in the physical education program). At the end of the 15-week, two groups underwent the examination of fitness like the first-time testing.

A new basketball programs

A new 15-week basketball program was divided into four categories, such as fitness, skills, tactics, and other training (described in Table 1). Therefore, the training intensity increased regularly day after day. During training, tactics and skill-based exercises (e.g., tip-in, lay-up and block, rebound, and spin move), stealing techniques, and mixed training (e.g., man-to-man, triangle defense, and fast break). In addition, it familiarized with the rules and provided mental training for the competitions. In contrast, the currently used program (PE course) focused only on fitness training and two techniques (dribble and shot) to evaluate students' final grades.

STATISTICAL ANALYSIS

All data were expressed as mean and standard deviation values (mean±SD). Data collections were analyzed by using SPSS for Windows version 20. Descriptive analysis was used to identify the subject characteristics. Independent Sample T-test was used to evaluate the differences in each test between control and experimental groups. Pair Sample T-test was used to identify the differences between pre-test and post-test. Fractional Growth Rate (W%) was used to identify the level of fitness growth after 15-week training (Brody, 1927). Level of statistical significance was set at $p<.05$.

Table-1: A new basketball program in 15-week experiment

No.	Months	8		9				10					11				12		
	Weeks	H	T	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	T
1. Fitness training																			
+ Speed				x	x	x	x												
+ Strength						x	x	x											
+ Endurance				x	x	x	x	x	x										
+ Co-operation									x	x	x	x	x	x	x	x	x		
+ Agility									x	x	x	x	x	x					
+ Flexibility								x	x	x									
+ Reaction time									x	x	x								
+ Mixed training												x	x	x	x	x	x	x	
2. Skills																			
+ Personalization				x	x	x	x	x	x	x	x	x	x	x	x				
+Dribble control				x	x	x	x	x	x	x	x								
+ Lay-up & block											x	x	x	x	x				
+ Jump-shot															x	x	x		
+ Mixed training														x	x	x	x	x	
3. Tactics																			
+ Individuals							x	x	x	x	x	x	x	x					
+ Defensive													x	x	x	x			
+ Offensive															x	x	x	x	
+ Mixed training																x	x	x	
4. Other training																			
+ Laws				x	x	x													
+ Mental training		x	x	x														x	x

Notes: x indicated that being trained, the gray areas were being tested. H: health examination day. T: testing day.

RESULTS AND DISCUSSIONS

The subjects' characteristics are presented in Table 2.

Table-2: Subjects' characteristics (n=64)

Group	Age (years)	Height (cm)	Weight (kg)
Control (n=32)	20.16±0.37	172.25±5.23	62.66±8.55
Experimental (n=32)	20.31±0.54	171.25±3.95	61.56±6.3
All (n=64)	20.23±0.46	171.75±4.63	62.1±7.47

Values are mean ± standard deviation.

The average age, height, and weight of 64 healthy male students were 20.23±0.46 years (mean ± SD), 171.75±4.63 cm, and 62.1±7.47 kg, respectively. In the control group, the average age, height, and weight were 20.16±0.37 years, 172.25±5.23 cm, and 62.66±8.55 kg respectively, while 20.31±0.54 years, 171.25±3.95 cm, and 61.56±6.3 kg respectively in the experimental group.

The differences in students' fitness between control and experimental groups before the applied of the 15-week basketball training program at Saigon University are shown in Table 3. There were no significant differences in five tests (30 seconds sit-up test, 30m sprint test, 4x10m shuttle run test, standing long jump test, and 5 minutes running field test) between the control and experimental group. It means that the level of fitness in two groups is quite similar. Therefore, author continued to implement the application of 15-week training programs in each specific group.

Table-3: Differences between control and experimental groups before the experiment

Test	Group	Mean±SD	t	p
1	Control	17.78±1.56	-0.086	.932
	Experimental	17.81±1.33		
2	Control	4.69±0.17	0.164	.871
	Experimental	4.68±0.3		
3	Control	11.75±0.23	0.179	.858
	Experimental	11.74±0.29		
4	Control	218.13±16.7	-0.054	.957
	Experimental	218.34±15.81		
5	Control	970.78±67.4	-.0455	.651
	Experimental	973.8±82.88		

Notes: 1: 30 seconds sit-up (times), 2: 30m sprint (s), 3: 4x10m Shuttle run (s), 4: Standing long jump (cm), 5: 5 mins running field (m). SD: Standard deviation.

The differences in students' fitness between pre and post-test (before and after the application of the training program) in both control and experimental groups are presented in Table 4. Results showed that there were significant differences between pre and post-test in all fitness testing and in both groups (control and experimental group). It means that two programs were suitable for male students at Saigon University to enhance their fitness during the period of studying physical education.

Table-4: Differences between pre- and post-test in control and experimental group

Group	Test	Time		t	p	W%
		Pre-test	Post-test			
Control	1	17.78±1.56	18.91±1.67	-6.757	.000	2.6
	2	4.69±0.17	4.6±0.16	13.508	.000	1.84
	3	11.75±0.23	11.7±0.24	8.723	.000	0.38
	4	218.13±16.7	227.97±16.8	-63.000	.000	4.41
	5	970.78±67.4	995.47±64.8	-13.752	.000	2.51
Experimental	1	17.81±1.33	19.34±1.58	-11.377	.000	8.42
	2	4.68±0.3	4.48±0.27	7.021	.000	4.38
	3	11.74±0.29	11.55±0.3	14.443	.000	1.6
	4	218.34±15.81	238.13±15.12	-11.245	.000	8.66
	5	973.8±82.88	1077.19±90.71	-9.938	.000	9.42

Notes: 1: 30 seconds sit-up (times), 2: 30m sprint (s), 3: 4x10m Shuttle run (s), 4: Standing long jump (cm), 5: 5 mins running field (m). Values are mean ± standard deviation.

Besides, the highest rate of growth in the control group was the leg power (4.41%), while results indicated 03 fitness got the high rate of growth in the experimental group (9.42% in MAS, 8.66% in power of leg, and 8.42% in speed). Indeed, our study showed a positive improvement in all basketball fitness tests for male students who participated in physical education courses at Sai Gon University in both groups before and after the application of two training programs. Much research did confirm this increasing such as Mancha-Triguero *et al*. (2020); Tuan & Giang (2017), Scanlan *et al*. (2014), Yilmaz (2014), etc. Moreover, the differences in students' fitness between control and experimental groups after the application of the 15-week training program at Saigon University are presented in Table 5.

Table-5: Differences between control and experimental groups after the experiment

Test	Group	Mean±SD	t	p
1	Control	18.91±1.67	-1.076	.286
	Experimental	19.34±1.58		
2	Control	4.6±0.16	2.144	.037
	Experimental	4.48±0.27		
3	Control	11.7±0.24	2.25	.028
	Experimental	11.55±0.3		
4	Control	227.97±16.8	-2.542	.014
	Experimental	238.13±15.12		
5	Control	995.47±64.8	-4.147	.000
	Experimental	1077.19±90.71		

Notes: 1: 30 seconds sit-up (times), 2: 30m sprint (s), 3: 4x10m Shuttle run (s), 4: Standing long jump (cm), 5: 5 mins running field (m). SD: Standard deviation.

There were significant differences between experimental and control groups in speed (30m sprint test), agility (4x10m Shuttle run test), power of leg (standing long jump test), and MAS (5 mins running field test), except the core strength (30 seconds sit-up test). The results demonstrated that after the application of a new basketball program, the experimental group had a higher score in speed, agility, power of leg, and MAS than the control group. Basketball is one of the fastest-paced sports in the world. Therefore, speed and agility were necessary for basketball players to improve footwork in competition (Mancha-Triguero *et al*., 2019). It is also key in decreasing the incidence of injury for players (Olsen *et al*., 2005). Besides, the ability to perform rapid sprint, start running, and stop continuously, while always keeping an eye on the opponent or the ball had a very important role in the Games of basketball (Lockie *et al*., 2014), as well as required to change direction rapidly depend on the Game situation (Spiteri *et al*., 2014). Therefore, any basketball training program needs to meet the growth in speed and agility.

According to Frane *et al*. (2010), athletes with lower training status or lower training levels would have lower results in acceleration, agility, the explosive

of strength, and the power of take-off. In our study, participants in the experimental group were pushed harder to run and move under the application of the training program might answer for better results in speed, agility, MAS, and power of leg than in the control group. These differences may come from the fact that a new basketball program included such training as conditioning training (campus and on-court run) in fitness training, the special situation in skills training, and position play in tactics training (more detail in Table 1). Besides, SiSic *et al*. (2016) noted that the more increasing in agility, the higher score in power, especially in basketball was the power of leg. Results in this study also indicated a similar consequence. Dabonneville *et al*. (2003) showed that the 5-min running field test might be used to evaluate an individual's training velocity on the actual training ground for male trained athletes. It was reliable for testing the maximum aerobic speed (MAS), especially in a heterogeneous group. Practically speaking, when you need the higher demand in running, the MAS must also increase (Baker & Heaney, nd). In this study, the MAS index also increased caused the demand for 15-week training.

Freitas *et al*. (2016) indicated that high-resistance circuit training might make athletes more susceptible to higher exhaustion, which led them to perform less effectively. However, if the intensity was from low to moderate, it also did not reduce mobility at all. In our study, this was the first time the 15-week program was implemented in male basketball students, who felt strange to the program but otherwise motivated and sometimes became exhausted with the way of training. However, the intensity of training was not too heavy in every training session, and it only took once per week as in the physical education program. Thus, participants had enough time to recover and avoid the same intense training routines as other training programs.

A new 15-week basketball program at Saigon University had a positive enhancement on speed, agility, power of leg, and MAS; however, the core strength (in sit-up test) indicated unchanged. Core strength involves the strength of trunk muscles, which was necessary for playing basketball. Kumar (2019) noted that core strength training could improve the fitness of speed. The unchanged core strength in this study might be explained that the strength training focused on weight lifting and jumping on the court with weight. That exercises were similar using in the current program of the physical education course. This study attempted to find a better way to improve students' fitness during their full-time major studying. Thus, they took less time to join the basketball club in the second semester and were ready for training, in line with the competition coming close. The results indicated that two training programs were also great for male students at Saigon University. However, the application of a new basketball program met the increasing training needs of students in basketball at Saigon University. We suggest organizing more physical education courses according to a new basketball program in the next academic year and classifying students in terms of training levels to achieve optimal good results.

CONCLUSIONS

In short, the results indicated that a new 15-week basketball program had a positive effect on speed, agility, power of leg, and MAS for male students at Saigon University, except core strength. It also created a healthy environment in studying physical education. In addition, the participants of this study had a lot of time for fun, explored their abilities, and improved their physical fitness in basketball, which helped them to develop more social relationships for later professional work. Future studies should be clarified the impact of that program for female students, in line with the classification of participants, i.e., less exercise, long-term training, and high level in training of students.

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