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Evaluation the application of the 26-workout to enhance the physical fitness – A case study in young male distance cycling athletes in an Giang province, Vietnam

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ABSTRACT: *The purpose of this study was to select and apply the 26 workouts in order to improve the physical fitness for young male distance cycling athletes in An Giang province, Vietnam. 08 healthy male were chosen with at least 3-4 years training in distance cycling.Results showed that the 26 workouts were selected to improve the physical fitness through the actual of training in An Giang province, participant's characteristics, former studies, and expert interviews. Besides, there were significant differences in all 05 tests to evaluate the physical fitness after the application of the 26-workout. Moreover,the highest rate of growth was in flexibility test (9.76%), while the lowest one in 10km cycling (0.56%). This reflects that the endurance ability of participants was so high (caused by low improvement). Therefore, it is necessary to apply the 26-workout more flexibly and closely to improve the physical fitness next year. It was concluded that the application of the 26-workout has brought a good result and was suitable for the development of physical fitness in young male cycling athletes in An Giang province, Vietnam.Future studies should be conducted on a group of females, diverse in training levels, and/ or on the other ability that need to promote a good distance cycling athlete.*

KEYWORDS*:* the 26-workout, physical fitness, young healthy male, distance cycling

INTRODUCTION

Cycling is one of the widely developed sports in Vietnam. In fact, it is an indispensable need for all ages, genders and plays an important role in education, health promotion, entertainment in daily life. It has attracted a large number of participants, from teenagers to the elderly, from amateurto gifted or professional athletes, not only in An Giang province but in the whole country. In the field of high-achievement sports in our country, there have really been remarkable changes in all sports in general and in which cycling.In competition, athletes must consume a lot of energy, thus they have reserved enough energy needed for the race to become a winner.The characteristics of cycling requires athletes to have perseverance in training, to meet physiological and psychological factors, and especially physical fitness to overcome the distance cycling competition content. The intensity of the Game in cycling has taken place continuously, sometimes lasting for more than half a month, and the route of cycling passed and sloped extending from this province to another. It can be said that

physical fitness is the key point for cyclists to achieve high results in competitions. Therefore, it is necessary to have specific work-outs in distance cycling at each specific age with the desire to enhance the achievementin National cycling competitions.

In An Giang province so far, there has not been a comprehensive research topic on distance cyclists. Therefore, if we do not grasp the training process and physical development of cycling athletes, it is difficult to improve the acievement in competition. Besides, the differences in region, age, training habits, manager's vision in cycling, etc, might effect to the physical development of athletes. According to Gratton & Jones (2004), a certain theory might have been developed and empirically tested in one area but have not received the same attention elsewhere. From the perspective of local sport workers, it was necessary to have appropriate work-outs to improve the physical quality of the province's cyclists to meet the development trend in this sport, that was our rationale of this study.

MATERIAL AND METHODS

Participants

The volunteer and selected participants were 08 healthy male cycling athletes, who have attended the cycling club in An Giang province, Vietnam. None of the participants had any physical problems, smoking, alcohol using or were taking any medication. All of the participants joined the 6-month trainingbefore the competition came. They were informed of the test procedures before providing written consent. Besides, participants were recommended to continue their daily dietary and their habits throughout the study.

Procedures

Two weeks before, each participant answered a brief baseline questionnaire about their personal information and sport-related injury history. One week after that, all participants came to examine their physical fitness before the trainingprogram began.05 tests were used to evaluate the physical fitness as vertical jump test (cm), stand and reach flexibilty test (cm), pedal frequency test (rpm-revolutions per minute), 200m sprint cycling (s), and 10km cycling (s) with high validity and realiable.Then, all participants experienced the 6-month training, included the application of 28 work-outs (described in Figure 1). The time for training was 8.00 to 10 am and 14.00 to 16.00 pm everyday. Atthe end of the training program, all participants underwent the examination of fitness like the first-time testing.

Table 1. A 6-month training program for young cycling athletes.

Months	6		7				8				9				10				11				12			
Weeks	Health exam	T	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Speed		x	x	x	x	x	x	x	x	x																
Strength		x		x	x	x	x	x	x	x	x	x	x	x												
Endurance		x					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Flexibility		x									x	x	x	x	x	x	x	x	x	x	x					
Agility		x													x	x	x	x	x	x	x	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

Participants' characteristics

The average age, height, and weight of 8young healthy maleathletes (at least3-4 years in cycling training) were 16.75±0.71years, 165.63±3.16cm, and 61.88±2.42kg respectively (more details in Table 2).They were informed of the test procedures before providing written consent. This study was approved by An Giang province, head coach, and the Provincial Scientific Council for the use of human beings.

Table 2. Subjects' characteristics (n=8)

Age (years)	Height (cm)	Weight (kg)
16.75±0.71	165.63±3.16	61.88±2.42

Note:Values are mean ± standard deviation.

The selection of the 26-workout to improve the physical fitness in distance cyling for young male at AnGiang province.

Based on the the characteristics of the study, the actual conditions atAn Giang province, the yearly training program for cycling athletes, and the results of many former studies, we selected 40 workouts (more details in Table 3) which were reference to the practical application in the local province. They were (1) 5x30m repeated sprint, (2) 5xknee-up speedy in 10s, (3) 3x80m repeated sprint, (4) Cycling sprint in 1 min, (5) Rulo practice, (6) 100m-500m cycling sprint, (7) Spining the small plate, (8) speed cycling at short interval, (9) High jump with ball, (10) 40cm high platform step, (11) Back squat, (12) Back squat with high knee, (13) Back squat with vertical split, (14) Leg press, (15) weightlifting with front and back jumping, (16) Frog jumping, (17) Pull-up bar, (18) Belly stick, (19) Pull weights on your hamstrings, (20) Leg extension with weights, (21) Hand dumbbells, (22) Tiptoe suat with weights, (23) Stairs running, (24) Stairs jumping, (25) Push-ups, (26) Motocycle guide practice, (27) Pulling teammates practice, (28) Variable speed in distance cycling, (29) Individual trial, (30) 200m cycling sprint, (31) Climbing practice in cycling, (32) 8-10km cycling, (33) 400-600m variable speed in running, (34) endurance in cycling with upstanding, (35) 200m cycling sprint fatigue, (36) reach and sit flexibility, (37) Rope jumping, (38) cycling through the pile, (39) Balance cycling, (40) Cycling through the obstacle.Then we divide these workouts into 5 physical fitness categories such as speed (from 1-8), strength (9-25), endurance (26-34), Flexibility (35-37), and agility (38-40).

Table 3. Results of the expert's interview

Work-outs	1st interview (n = 30)		2nd interview (n = 30)		χ^2	Work-outs	1st interview (n = 30)		2nd interview (n = 30)		χ^2
	Agreed		Agreed				Agreed		Agreed		
	n	%	n	%			n	%	n	%	
1	24	80.0	25	83.3	0.37^{ns}	**21**	24	80.0	25	83.3	0.37^{ns}
2	23	76.7	24	80.0	0.33^{ns}	**22**	23	76.7	21	70.0	1.14^{ns}
3	22	73.3	21	70.0	0.27^{ns}	**23**	26	86.7	27	90.0	0.54^{ns}
4	25	83.3	26	86.7	0.44^{ns}	**24**	27	90.0	28	93.3	0.73^{ns}
5	21	70.0	24	80.0	2.67^{ns}	**25**	26	86.7	24	80.0	1.60^{ns}
6	27	90.0	26	86.7	0.54^{ns}	**26**	28	93.3	27	90.0	0.73^{ns}
7	22	73.3	25	83.3	2.95^{ns}	**27**	24	80.0	25	83.3	0.37^{ns}
8	24	80.0	25	83.3	0.37^{ns}	**28**	25	83.3	24	80.0	0.37^{ns}
9	21	70.0	20	66.7	0.26^{ns}	**29**	21	70.0	24	80.0	2.67^{ns}
10	23	76.7	22	73.3	0.30^{ns}	**30**	25	83.3	23	76.7	1.39^{ns}
11	24	80.0	21	70.0	2.67^{ns}	**31**	28	93.3	27	90.0	0.73^{ns}
12	26	86.7	25	83.3	0.44^{ns}	**32**	24	80.0	23	76.7	0.33^{ns}
13	27	90.0	25	83.3	1.92^{ns}	**33**	23	76.7	21	70.0	1.14^{ns}
14	21	70.0	22	73.3	0.27^{ns}	**34**	24	80.0	23	76.7	0.33^{ns}
15	28	93.3	29	96.7	1.17^{ns}	**35**	26	86.7	25	83.3	0.44^{ns}
16	29	96.7	28	93.3	1.17^{ns}	**36**	27	90.0	28	93.3	0.73^{ns}
17	21	70.0	22	73.3	0.27^{ns}	**37**	25	83.3	27	90.0	1.92^{ns}
18	24	80.0	22	73.3	1.24^{ns}	**38**	29	96.7	28	93.3	1.17^{ns}
19	25	83.3	27	90.0	1.92^{ns}	**39**	24	80.0	21	70.0	2.67^{ns}
20	27	90.0	26	86.7	0.54^{ns}	**40**	28	93.3	26	86.7	2.47^{ns}

Notes: (1) 5x30m repeated sprint, (2) 5xknee-up speedy in 10s, (3) 3x80m repeated sprint, (4) Cycling sprint in 1 min, (5) Rulo practice, (6) 100m-500m cycling sprint, (7) Spining the small plate, (8) speed cycling at short interval, (9) High jump with ball, (10) 40cm high platform step, (11) Back squat, (12) Back squat with high knee, (13) Back squat with vertical split, (14) Leg press, (15) weightlifting with front and back jumping, (16) Frog jumping, (17) Pull-up bar, (18) Belly stick, (19) Pull weights on your hamstrings, (20) Leg extension with weights, (21) Hand dumbbells, (22) Tiptoe suat with weights, (23) Stairs running, (24) Stairs jumping, (25) Push-ups, (26) Motocycle guide practice, (27) Pulling teammates practice, (28) Variable speed in distance cycling, (29) Individual trial, (30) 200m cycling sprint, (31) Climbing practice in cycling, (32) 8-10km cycling, (33) 400-600m variable speed in running, (34) endurance in cycling with upstanding, (35) 200m cycling sprint fatigue, (36) reach and sit flexibility, (37) Rope jumping, (38) cycling through the pile, (39) Balance cycling, (40) Cycling through the obstacle. ns - the level of significance was higher than 0.05.

Expert's interviews.

30 experts (included coaches, trainers, managers in cycling) were chosen to evaluate the feasibility of the 40 work-outs. The questionnaire was sent two times, two months apart, to the same expert. A 2-level rating was used (e.g., Agree and Not agree). Workouts with a higer rate of over 80% selected by experts as "Agree" will be applied to the training program for young male cycling at An Giang province. Besides, expert's interview results at both times must also meet this criterion or higher (more details in Table 3).

Therefore, from the results of expert interviews in Table 3, we selected the workouts with higher than 80% chosen. According to this principle, the 28-workout was chosen such as (1) 5x30m repeated sprint, (2) 5xknee-up speedy in 10s, (3) Cycling sprint in 1 min, (4) 100m-500m cycling sprint, (5) speed cycling at short interval, (6) 200m cycling sprint fatigue, (7) Back squat with high knee, (8) Back squat with vertical split, (9) weightlifting with front and back jumping, (10) Frog jumping, (11) Belly stick, (12) Pull weights on your hamstrings, (13) Leg extension with weights, (14) Hand dumbbells, (15) Stairs running, (16) Stairs jumping, (17) Push-ups, (18) Motocycle guide practice, (19) Pulling teammates practice,

(20) Variable speed in distance cycling, (21) 200m cycling sprint, (22) Climbing practice in cycling, (23) 8-10km cycling, (24) endurance in cycling with upstanding, (25) reach and sit flexibility, (26) Rope jumping, (27) cycling through the pile, (28) Cycling through the obstacle.

The application of the 26-workout to enhance the physical fitnessfor young male cycling athletes at AnGiang province

Differences in the physical fitness between before and after the application of the 28-workoutfor young male cycling athletes at An Giang province are presented in Table 4.

Table 4. Differences in the physical fitness between before and after the experiment

Test	pre-test	post-test	W%	t
1	46.86±4.76	50.13±6.13	5.75	-5.245*
2	16±2.33	17.86±3.48	9.76	-3.91*
3	168.63±11.39	172.5±10.85	2.58	-6.347**
4	14.55±0.65	14.13±0.63	4.34	11.85**
5	940.21±38.03	935.63±38.3	0.56	7.04**

Notes: *1: vertical jump test (cm), 2: stand and reach flexibilty test (cm), 3: pedal frequency test (rpm), 4: 200m sprint cycling (s), 5: 10km cycling (s). W%: Growth Rate (%). *, ** significant differences at the level 0.01, 0.001.*

Results in Table 4 showed that there were statistically significant differences in all evaluation tests to improve physical fitness for young male cycling athletes in An Giang province. It means that the application of 26-workout in this study has a positive effect on participants, which enhanced their physical fitnessthrough training. In our study, we built up the 26-workout to improve the physical fitness, the key to make distance cycling athletes had to become a winner in the Game.

In addition, results in this study also showed that there was growth in all evaluation tests, but the growth rate was still quite modest, from 0.56%-9.76% (shown in Figure 1). Therefore, the highest rate of growth was in flexibility test (9.76%), while the lowest one in 10km cycling (0.56%). This reflects that the endurance ability of participants was so high (caused by low improvement). However, if you want to become a success distance cycling athlete, you need to focus in many aspects excepts the physical fitness (most athletes focused on th endurance aibility), such as teammate tactics, climbing ability, good nutritions, good mental in competition. Again, these workouts should be applied during the following year's training cycle to enhance the achievement performance for cycling athletes caused of their benefits. Future studies should be conducted on a group of females, diverse in training levels, and/ or on the other ability that need to promote a good distance cycling athlete.

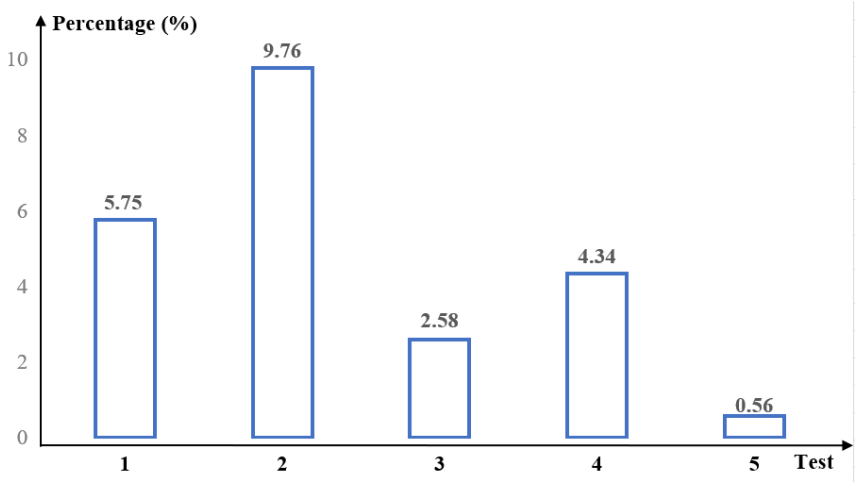

Figure 1. The rate of growth in 5 test evaluations (values in %)

Notes:1: vertical jump test (cm), 2: stand and reach flexibilty test (cm), 3: pedal frequency test (rpm), 4: 200m sprint cycling (s), 5: 10km cycling (s).

CONCLUSION

In short, the study has identified the 26 workouts to improve the physical fitness and applied these workouts to the yearly training for young male distance cycling athletes. Besides, the application of these workouts has brought a good result and was suitable for the development of physical fitness in young male cycling athletes in An Giang province, Vietnam.

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Appendix 1

Months	**6**		**7**				**8**				**9**				**10**				**11**				**12**			
Weeks	**Health exam**	**T**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Speed		x	x	x	x	x	x	x	x	x																
Strength		x		x	x	x	x	x	x	x	x	x	x	x												
Endurance		x					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Flexibility		x									x	x	x	x	x	x	x	x	x	x	x					
Agility		x													x	x	x	x	x	x	x	x	x	x	x	x