APPLICATION OF PHYSIOLOGICAL INDICATORS IN ASSESSING THE MOVEMENT OF INTENSIVE ATHLETICS STUDENTS OF HANOI UNIVERSITY OF PHYSICAL EDUCATION AND SPORTS (EVIDENCE OF SPECIALIZED STUDENTS IN SHORT RUNNING AND LONG JUMP)

Nguyen Duy Quyet[1]

Abstract:

Using conventional scientific research methods in physical education science, the results of the application of physiological indicators in assessing the amount of movement for intensive athletics students who practise short run and long jump are the basis for lecturers and coaches to plan teaching and training in accordance with the training level of students, contributing to improving the effectiveness of teaching and coaching.

Keywords: Physiological index, amount of exercise, intensive athletics, short running, long jump, students, Hanoi University of Sports and Physical Education.

INTRODUCTION

In sports teaching and coaching, assessing the training level of in-depth students helps lecturers and coaches assess the training level so that they can plan teaching and training to improve public efficiency of teaching and coaching.

One of the important factors contributing to the achievement of sports competition is the role of science in teaching - training, the result of effective exploitation and application of the factors that help gaining high achievements such as modern training methods, enthusiastic lecturers and coaches, application of achievements in scientific research in medicine - biology, psychology, biology - mechanics, nutrition science study and absorption, studies on environmental and geographical changes in sports training ... To meet the needs and to promote the application of science and technology in intensive training for athletics students. From the aforementioned analysis, we initially study: "Application of physiological indicators in assessing the amount of movement of intensive athletics students Hanoi University of Physical Education and Sports (citing intensive athletics students pratising short run and long jump)"

RESEARCH METHODS

To solve the research problem, it is necessary to use the following main methods: Data analysis and synthesis, seminar interviews, biomedical examination and statistical math.

RESULTS AND DISCUSSION

1. Determination of anthropometric and physiological indicators in assessing the training level of intensive athletics students of Hanoi University of Physical Education and Sports (Evidence in content: Short run, long jump)

Through analysis and synthesis of general and professional materials, through practical teaching and coaching activities for students in short run and long jump, especially based on the actual conditions of facilities quality and characteristics of the content, research and selection of physiological indicators to be applied in assessing the training level of students in Hanoi University of Physical Education and Sport. The selection of feasible physiological criteria for inclusion in the teaching and coaching process for intensive

athletics students are:

- Anthropometric indicators to assess the influence of bodybuilding on the capacity of intensive athletic students

- Physiological indicators include:

+ Morphological indicators: Height, weight, long legs A, long legs B, long legs H, long legs ASin, Long arm span, long hands, wide hands, long feet, wide feet, wide feet shoulder.

+ Respiratory index: Vital Capacity (VC), Forced Vital Capacity (FVC), Maximal Voluntary Ventilation (MVV) (before training, the next morning after training). There is a variation of the index to assess fatigue of the breathing muscles and central nervous system.

+ Anaerobic capacity indexes: Relative Peak Power (RPP), Relative total Anaerobic Capacity (RAC), anaerobic attenuation index (AF).These indicators are intended to complement and evaluate the body's anaerobic capacity.

2. Application of biomedical indicators in evaluating the training level of high-level athletes with 2 contents: Short run, long jumb

Application results of the above indicators are presented in the following tables.

Table 1. Examination results of morphological indicators of senior athletes with short run, long-jump content (n = 16)

Sex	Index	Height	Weight	Long leg A	Long leg B	Long leg H	Long leg Asin	Long arm span	Long Hand	Wide Hand	Long feet	Wide Foot	Shoulders
Male (n=5)	Max	183.0	70.2	102.0	94.0	109.0	33.0	274.0	19.0	9.2	23.0	9.7	45.0
	Min	164.0	59.0	99.0	88.0	101.0	27.0	175.0	18.0	7.8	22.0	7.8	40.0
	$\overline{X}$	173.5	64.6	100.5	91	105	30	224.5	18.5	8.5	22.5	8.75	42.5
	δ	4.7	3.3	1.0	2.3	2.4	2.1	42.5	0.3	0.5	0.4	0.5	2.3
Female (n=5)	Max	172.0	57.0	100.0	91.0	105.0	32.0	173.0	17.4	7.0	22.7	9.3	40.0
	Min	154.0	48.0	85.0	82.0	92.0	22.3	152.0	15.0	6.0	22.8	7.9	33.0
	$\overline{X}$	163	52.5	92.5	86.5	98.5	27.15	162.5	16.2	6.5	22.75	8.6	36.5
	δ	4.1	3.3	5.2	3.8	5.5	3.9	8.5	0.9	0.3	0.5	0.6	2.5

The results in Table 1 show that the figure of athletic students at the Hanoi University of Physical Education and Sport in accordance with the morphological index of Vietnamese people is higher than that of ordinary Vietnamese. This is entirely consistent with the fact that athletics students's indexes initially recruited are higher than the average of a person.

Table 2. Test results of physiological indicators of senior athletes with short run, long-jump content (n = 16)

Index		Respiratory function					Anaerobic capacity		
		VC	MVV	VC	FVC	MVV	RPP	RAC	AF
		Liter	Liter /min	Liter	Liter	Liter /min	w/kg	w/kg	%
Male (n=8)	Max	5.1	162.5	5.0	3.9	155.3	10.3	7.9	534.1
	Min	3.9	139.9	3.5	3.0	132.2	9.6	7.2	25.3
	$\overline{X}$	4.5	151.2	4.25	3.45	143.75	9.95	7.55	279.7
	δ	0.4	6.2	0.5	0.4	8.7	0.4	0.5	9.7
Female (n=8)	Max	3.2	125.3	3.1	2.5	110.3	9.1	7.9	42.0
	Min	2.9	93.7	2.8	2.0	97.6	8.1	6.0	22.4
	$\overline{X}$	3.05	109.5	2.95	2.25	103.95	8.6	6.95	32.2
	δ	0.1	12.5	0.1	0.2	5.6	0.5	0.7	8.8

Vu Thi Men, leaping three steps away (photo source:https://tintucvietnam.vn)

The results in Table 2 show:

- VC number: Male: before the training session is 3.9 ± 0.4 liter; The next morning after training session is 5.1 ± 0.6 liters; Women: before the training session is 2.9 ± 0.1 liters; The next morning after workout is 3.2 ± 0.1 liters.

- FVC number: Male: before the training session is 3.0 ± 0.4 liter; The next morning after workout is 3.9 ± 0.4 liters; Women: before training is 2.0 ± 0.3 liter; The next morning after workout is 2.5 ± 0.2 liters.

- MVV: Male: before the training session is 132.2 ± 8.7 liters / minute; The next morning after workout is 155.3 ± 8.7 liters / minute; Women: before training is 97.6 ± 5.6 liters / minute; The next morning after training session is 110.3 ± 5.6 liters / minute.

- Anaerobic capacity index: Male: anaerobic capacity test through wingate test with RPP index of 10.3 ± 0.4 w / kg; RAC is 7.9 ± 0.5 w / kg; AF is $279.7 \pm 8.8\%$; Female: anaerobic capacity test through wingate test with RPP of 8.6 ± 0.5 w / kg; RAC is 6.95 ± 0.7 w / kg; AF is $32.2 \pm 8.8\%$.

Table 3. Results of heart-beat and blood pressure testing of intensive athletics students in the content of short running, long jump (n = 16)

Index		Before training				After training			5mis after training			Next morning		
		Base heart rate	HA max	HA min	Heart beat	Ha max	HA min	Heart beat	HA max	HA min	Heart beat	HA max	HA min	Heart beat
Male (n=8)	max	68	138	79	70	159	71	146	120	80	97	129	69	86
	min	59	89	49	59	89	59	121	100	60	80	89	53	64
	$\overline{X}$	63.5	113.5	64	64.5	124	65	133.5	110	70	88.5	109	61	75
	δ	3	7	4	5	10	3	9	7	8	6	4	5	7
Female (n=8)	max	76	110	64	82	129	79	142	124	80	100	123	70	86
	min	65	79	59	67	110	60	121	100	60	83	89	50	70
	$\overline{X}$	70.5	94.5	61.5	74.5	119.5	69.5	131.5	112	70	91.5	106	60	78
	δ	3	6	3	5	7	7	7	9	7	6	5	6	5

The above results show that the respiratory index and anaerobic capacity are suitable for the training athletes. However, some high respiratory function indicators indicate fatigue during exercise. So teaching, training need to adjust the amount of movement to suit the object.

The results in table 3 show:

- Heart rate: Male: basic heart rate is 63.5 ± 3 times / minute; before training is 64.5 ± 5 times / minute; immediately after workout the heart rate fluctuates in the range of 124 ± 10 times / minute; after 5 minutes, recover to 88.5 ± 7 times / minute; the next morning is 70 ± 8 times / minute; Female: cardiac muscle is 70.5 ± 3 times / minute; before training is 74.5 ± 5 times / minute; immediately after workout the heart rate fluctuates in the range of 131.5 ± 7 times / minute; after 5 minutes, recover to 91.5 ± 7 times / minute; the next morning is 75 ± 7 times / minute.

- Blood pressure: Male: the maximum blood pressure before training session ranges from 113.5 ± 6 mmHg, the minimum blood pressure ranges 64 ± 3; Immediately after training session, the maximum blood pressure is within 124 ± 7 mmHg, the minimum blood pressure fluctuates within 65 ± 7 mmHg; after 5 minutes of recovering, maximum blood pressure is within 110 ± 9 mmHg, minimum blood pressure within 70 ± 7 mmHg; The next morning maximum blood pressure is within 109 ± 5 mmHg, minimum blood pressure in the range of 61 ± 6 mmHg; Women: maximum blood pressure before exercise ranges from 94.5 ± 6 mmHg, minimum blood pressure ranges 61.5 ± 3 mmHg; Immediately after the maximum blood pressure training session was within 119.5 ± 7 mmHg, the minimum blood pressure fluctuated within 69.5 ± 7 mmHg; after 5 minutes of recovering maximum blood pressure within 112 ± 9 mmHg, minimum blood pressure within 70 ± 7 mmHg; The next morning maximum blood pressure is within 106 ± 5 mmHg, minimum blood pressure is within 60 ± 6 mmHg.

The results also show that the indicators are completely suitable for Vietnamese people.

However, there are some higher-than-normal heart rate readings due to exercise and also show fatigue from strenuous exercise.

The evolution of physiological indicators of men and women is the basis for lecturers and coaches to adjust the training plan, the amount of mobilization suitable for students, contributing to improving the effectiveness of teaching and coaching

CONCLUSION

From the above results, it is possible to assess the intensive athletics athletes (short-running, long-jump content) adapting to the amount of exercise set by coaches in the training program. But there have been some signs of fatigue due to the relatively large amount of exercise (heart rate, respiratory function, anaerobic capacity) in men and women athletes.

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