



Research Article

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Body shape analysis of China's canoeing athletes

Jiangao Zhu

Tianjin University of Sport, China

ABSTRACT

Canoeing has a high statue in competitive sports. With physical fitness as a leading factor in canoeing, body shape is an essential guarantee of canoeing athletes. This paper adopts document literature and analyzes the body shape, skill and quality of canoeists. It discusses the advantages of fitness training of athletes and provides a scientific theoretical support for canoeing athletes.

Key words: Key words: canoeing; athletes; body shape; physical fitness

INTRODUCTION

I. CHARACTERISTICS OF CANOEING

Canoeing has contributed to 16 gold medals in the Olympic Games. It enjoys a high reputation among sports powers. China lists canoeing as key project of "119 Project" of General Administration of Sports. Studies on canoeing are carried out in a scientific way. It is expected that China's canoeing will make more progress and enter a higher stage.

As a sport with physical fitness as a leading factor, canoeing is featured by aerobic endurance. Its forward relies on non-fulcrum paddle according to certain rules. There are two types of canoeing, namely, kayak and canoe which is only participated by men. Based on the number of athletes, canoeing can be divided into single kayak, double kaya and four-people kayak, single canoe, double canoe and four-people canoe. The race is 200 meters, 500 m, 1000 m and 5000 m. The maximum strength (front 10-20 paddle), power speed (paddle power), rapid strength endurance (the latter part of the game) are all factors affecting the score, as is shown below:

Canoeing at different distance of oxygen demand and aerobic metabolism ratio			
Distance	Aerobic metabolism (%)	Anaerobic metabolism (%)	Oxygen consumption (L)
250	19	81	26
500	51	49	38
1000	63	37	54
2000	71	19	81
5000	92	8	182
10000	96	4	287

As a high intensive aerobic sport, the aerobic endurance is presented in all aspects of training and the race. One's endurance has much to do with skill and tactic in real competition. Canoeing requires a high supply of phosphagen at the beginning and the ending of the game to ensure the anaerobic glycolysis for energy metabolism of athletes. Besides, canoeing also has a high requirement on coordination and flexibility of muscles.

Body quality is essential to canoeing. Special strength is key to absolute speed and average speed. Strong body function and a good body shape are important factors to canoeing athletes. China's canoeing is moving ahead in a stable and sustainable way. This paper discusses the features of body shape, body function and body quality and provides a theoretical support for scientific development of canoeing.

2. CHARACTERISTICS OF CANOING ATHELETS

2.1 BODY SHAPE

In canoeing, the special physical condition is always a key factor to monitor the training and select the equipment. Test indicators of body shape include height, sitting height, upper arm length, knee height, hand length, weight, sit long arm, percentage of body fat, body mass index, height chest circumference index, sitting height index, body mass index, Ellis Man index, Levi index and Rohrer's index. With various indicators of athletes known, training schemes can be made to help them make more progress.

The basic body shape indicators of China's Elite Rowing Athletes				
Gender	Male		Female	
Index	Standard deviation	Average	Standard deviation	Average
Height	4.31	185.21	3.42	173.12
Sitting height	2.45	99.12	2.12	94.02
Upper arm length	1.57	35.13	1.25	32.01
Knee height	1.82	48.98	1.42	46.17
hand length	1.01	19.71	0.6	18.33
Weight	5.78	77.89	4.59	68.12
Sit long arm	3.97	145.11	3.27	137.51
Percentage of body fat	2.34	11.43	3.84	18.54
Body mass index	27.51	427.94	25.73	389.68
Height chest circumference index	2.11	53.94	2.43	55.47
Sitting height index	1.13	54.12	1.21	53.97
Body mass index	1.43	23.57	1.57	22.67
Ellis Man index	13.97	-5.71	13.29	-10.24
Levi index	0.55	24.12	10.12	129.57
Rohrer's index	8.7	125.43	9.91	128.43

The Table above shows details of each indicators of body shape. By comparing to international athletes' indicators, it is clear that stoutness is the most important indicator, followed by arm length. Chinese athletes are comparable to excellent foreign athletes in terms of height. The gap mainly lies in weight and percentage of body fat. Body mass index, body quality index, Levi index, weight, Rohrer's index are factors that need to be paid special attention so as to enhance the body shape of Chinese athletes.

The basic form of canoeing athletes in China				
Project	Average height	Middleweight	Average length of training	Average age
Male Kayak	186.89	83.39	6.43	21.43
Woman Kayak Athletes	175.38	67.54	6.4	21.06
Canoeing Athletes	185.37	82.97	6.41	21.37

The average height of China's canoeing athletes is 185.37cm with the majority at 188cm. The average weight is 82.97kg with the majority at 80-85kg. The average age is 21.37 and most are between 19 and 21. Male canoeists have an average height of 186.89cm and weight, of 83.39 kg, and age, 21.43. Female canoeists average at 175.38cm tall, 67.54 kg in weight. They report an average age of 21.06 years old. Training equipment in early periods can be selected according to their body shape. It is necessary to balance the training of mature athletes, back-up athletes and talents so as to register new progress in canoeing.

BODY FUNCTION

Endurance is a key feature of long time game. Improving the energy storage condition is one way to enhance the endurance so as to enhance the metabolism of athletes. Canoeing has a high requirement on metabolism that is related to endurance, strength and speed. The race distance is mainly 500 m and 1000 m. Most games are held in the afternoon. The aerobic endurance is presented in all aspects of training and the race and can affect the play of the athletes. Serum testosterone is the primary indicator of endurance. Testosterone is a steroidal compound with high activity. It belongs to androgens. The main physiological function of testosterone is to stimulate the synthesis of amino acids, enhance protein synthesis and promote metabolism. It can also promote skeletal growth hormone and serve as a measurement of the endurance and the speed.

BODY QUALITY

As a high intensive aerobic sport, canoeing also has a high requirement on coordination and flexibility of muscles. One's endurance has much to do with skill and tactic in real competition. Special strength is key to absolute speed and average speed. Together with coordination of the muscle, special strength holds key to paddling speed. A good body quality is a symbol of good physical fitness and key to acquire skills and make progress. Physical quality indexes of elite athletes in China are shown below.

Physical quality indexes of elite athletes in China	
Quality index	X±SD
Back forcekg (kg)	219.4±32.6
Grip (kg)	640.7±77.4
Chinning	17.9±5.3
Run 60 meters (s)	7.8±0.3

Run 60 meters (s) 7.8±0.3

Back strength and grip strength test can reflect the quality of the athletes, and pull-ups can reflect the strength characteristics of the upper extremity muscles and shoulder muscles. 60-meters run test reflects the rapid movement coordination of athletes. A good body quality means a strong trunk and long endurance. As important to the physical orientation of athletic sports, continuous motion game for a long time is its basic features. With physical fitness as a leading factor in canoeing, long time movement in the game is very common. Athletes are required to be equipped with fast speed. Thus, endurance, maximum speed, relative speed and relative endurance are elements to be tested. Canoeing also requires athletes to have good coordination and flexibility. Back strength, grip strength, one minute pull-ups and 60-meters run are essential indicators of physical fitness of athletes.

CONCLUSION

This paper discusses the features of body shape, body function and body quality and suggests for standard stoutness, Serum testosterone, back strength, grip strength, one minute pull-ups and 60-meter run for physical fitness of athletes.

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REFERENCES

- [1] Claessens AL. *Sports Sci* **1994**,12(4):391-401.
- [2] Wu Hao, Zhou Qinian. *Zhejiang Sport Science*, **2003**(04):12-32.
- [3] Li jianghua, Tang Yaohan, Tang Changfa. *Journal Of Beijing Sport University*, **2005**(06):774-776.
- [4] Cao Zhengyu. *Science & Technology Information*, **2009**(24):609-610.
- [5] Yuan Youhu. *China Urban Economy*, **2011**(01):219.
- [6] Liu xiaojun, Cai Guizhi. *Journal Of Weinan Teachers College*, **2009**(02):71-74.
- [7] Li Zongtao. *Shandong Sports Science & Technology*, **2007**(02):88-90.
- [8] Wu Hao, Xu Jusheng. *Journal Of Wuhan Institute Of Physical Education*, **2004**(01):73-79.