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Assessment of General Endurance Capacity in Male Youth Jujitsu Athletes of Dong Nai City Vietnam

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Abstract

The study assessed the general endurance status of 08 male athletes aged 16 – 18 years of the Jujitsu youth team of Dong Nai City with more than 02 years of training seniority. Through the synthesis of monographs and interviews with 15 experts and expert coaches, the project sets up a combination of measurement tools including 06 biological function indicators and 05 pedagogical tests to assess general endurance. Pre-experimental data showed that the endurance capacity of the sample system was relatively uniform with a low coefficient of variation in most test standards. However, when compared with the scientific works of domestic and foreign authors, the basic aerobic capacity and cardiovascular response function of the young male athlete Dong Nai currently stand at the low average threshold, not approaching the load norm of modern competition trends.

Keywords: Evaluation, status, endurance, male Jujitsu athletes, Dong Nai.

1. INTRODUCTION

Modern Jujitsu, especially Fighting and Contact competitions, is a direct individual combat martial art characterized by high-intensity intermittent movement with a dense competition density that swept through the day. This peculiarity places extremely strict requirements on professional fitness, in which endurance plays a key role in figuring out technical scoring performance and the ability to recover between fierce matches. The quantitative assessment of the first physical condition of young athletes is a mandatory scientific premise, helping managers and coaches accurately show limitations in biological functional structures. Stemming from that practical requirement, the article focuses on analyzing the current situation of the aerobic and anaerobic endurance level of male athletes of the Dong Nai City Jujitsu youth team, as a scientific argument to innovate the professional fitness training program.

2. METHODS AND ORGANIZATION OF RESEARCH (METHODS)

- **Object of study:** Physiological function and endurance level of male athletes.
- **Subject:** 08 male athletes aged 16 – 18 belonging to the Jujitsu youth team of Dong Nai City.
- **Measurement methods and equipment:** The study used a combination of biomedical equipment including Monark 891E dynamometer bicycle (Wingate test to assess anaerobic capacity), Beep test (indirect measurement of the maximum oxygen absorption threshold), spirometry (measurement of vital capacity) and 1-minute interval pedagogical test. Data are processed by statistical mathematics on Excel 2019 software through the following quantities: Average Addition, Standard Deviation, and Coefficient of Variable Error.

3. RESULTS AND DISCUSSION

3.1. Status of biological function indicators of male athletes

The results of measuring biological constants, cardiovascular capacity and anaerobic muscle capacity of the male athletes are summarized in Table 1.

Table 1: The status of the functional index of young male Jujitsu athletes in Dong Nai City ($n = 8$)

STT	Biological and anaerobic functional indicators	Minimum Value (Min)	Maximum Value (Max)	Mean Value ($\bar{X}$±SD)	Coefficient of Variable Error (Cv%)
1	Living Capacity (liters)	3.51	4.28	3.90 ± 0.25	6.42%
2	Cardiac Function Index ()HW	6.80	12.00	9.17 ± 1.88	20.54%
3	Maximum oxygen consumption threshold (ml/kg/min)VO_2max	44.10	50.20	46.93 ± 2.17	4.63%
4	Relative maximum anaerobic capacity (W/kg)RPP	8.70	12.38	10.18 ± 1.29	12.69%
5	Relative average anaerobic capacity (W/kg)$RMCP$	7.19	9.01	8.21 ± 0.62	7.57%
6	Muscle capacity attenuation coefficient (%)FI	38.00	42.37	40.47 ± 1.47	3.62%

The data in Table 1 proves that the oxygen absorption capacity (ml/kg/min) and durable anaerobic capacity (W/kg) of the young male athletes are very concentrated and uniformly distributed with an ideal uniformity of variable coefficients. In contrast, the cardiovascular function index shows an extremely large degree of dispersion with (wide range from 6.80 to 12.00). This reflects the current state of the cyclic response and the ability to recover pulse frequency after being subjected to a standard quantitative load of the students in the team is completely uneven. $VO_2max = 46.93 \pm 2.17 RMCP = 8.21 \pm 0.62 C_v < 10\% HWC_v = 20.54\%$

3.2. The current situation of the general endurance level through pedagogical tests

General fitness levels that indicate upper body, lower body local muscle strength, and continuous redirection endurance are summarized in Table 2.

Table 2: The current situation of the general endurance index of young male Jujitsu athletes in Dong Nai City ($n = 8$)

STT	General Endurance Pedagogical Testing Test	Minimum Value (Min)	Maximum Value (Max)	Mean Value ($\bar{X}$±SD)	Coefficient of Variable Error (Cv%)
1	1500m endurance run (sec)	330.00	346.00	338.13 ± 5.34	1.58%
2	Crunches for 1 minute (times)	45.00	67.00	52.50 ± 7.25	13.81%
3	Push-ups continuously for 1 minute (times)	40.00	47.00	44.19 ± 2.40	5.44%
4	Jump rope for 1 minute (times)	145.00	162.00	155.00 ± 6.23	4.02%
5	Shuttle Run 10m x 10 times (sec)	26.35	27.68	27.00 ± 0.47	1.75%

The results of Table 2 show that the full-body mechanical load capacity reveals a stable distribution with an extremely low variable coefficient in the 1500m test and the shuttle speed test. However, the 1-minute abdominal crunch test to evaluate core muscle endurance (Core) tends to be scattered with. This shows that the endurance strength of the abdominal and hip muscle groups between individuals in the formation has a clear differentiation, which requires the design of individualized exercises. $C_v = 1.58\% 10 \times 10 C_v = 1.75\% C_v = 13.81\% > 10\%$

3.3. Scientific discussion and comparison of data status

When placing the quantitative parameters of young male athletes in Dong Nai in the comparison matrix with scientific works published at home and abroad, the study set up important scientific arguments:

+ Living capacity:

The sample group achieved litters, lost significantly (lower than 0.70 litters) when compared with male athletes of the professional team of Ho Chi Minh City (litters). This data proves that their gas exchange amplitude and lung volume have not reached the best threshold. $3.90 \pm 0.25 4.60 \pm 0.35$

+ Cardiovascular function:

The HW average value of the actual condition is up to. Comparing the Ruffier standard classification scale, this index is close to the Poor level and much higher than that of the Ho Chi Minh City team. The phenomenon of rapid and pounding heartbeat and prolonged vascular recovery time is a clinical manifestation of the circulatory system not reaching the level of adaptation to high-intensity intermittent loads. $9.17 \pm 1.88 5.90 \pm 1.20$

+ On the maximum oxygen absorption volume ():

VO_2max Only ml/kg/min, deeply lower than the male team in Ho Chi Minh City. Ho Chi Minh City (ml/kg/min) and is especially far inferior to the international level such as the French men's national team (ml/kg/minute). Beneke's (2004) classic study confirms that Jujitsu combat activities require an aerobic energy system to carry up to the total energy of the entire battle to maintain power. This serious shortage of intracellular oxygen capacity is the core cause of exhaustion, decreased muscle strength and loss of accuracy of falling techniques in the second and third rounds. $46.93 \pm 2.1754.50 \pm 3.5058.7 \pm 3.177.8\%$

4. CONCLUSION

The results of quantitative analysis of the current situation confirm that the general endurance and biological function indicators of 08 male athletes of the Jujitsu youth team in Dong Nai City are currently standing at the low average threshold. The circulatory system reveals cardiovascular overload when subjected to load pressure (high) and basal oxyphilic capacity (low) that have not approached the standards of domestic and international high-level athletes. This situation is an objective scientific proof that the old physical training program is no longer effective. The coaching board needs to immediately change the traditional lesson plan, intervene with a new exercise system applying modern methods (such as HIIT, specific equipment exercise combinations) to accurately simulate the structure of the actual competition exercise norm, creating a breakthrough for local sports achievements in the coming period. $HWVO_2max$

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