

INITIAL AND FINAL VALUES OF OXYGEN CONSUMPTION OF THE CROSS COUNTRY ATHLETES WITH DIFFERENT TRAINING METHODS

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(Preliminary communication)

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Abstract

This study encompassed the sample of 151 male respondents, the students of Faculty of Physical Education in Pristina, aged 20 years, who were divided into three experimental groups. These groups were unified by the criterion of used variables. In order to estimate maximal oxygen consumption, previously described indirect non-laboratory method was used, which is suitable for mass use. Oxygen consumption was also measured before the experimental program applied in this study. The obtained statistical indicators have confirmed good selection of the subsamples to be studied, since statistically significant differences weren't found regarding maximal oxygen consumption before the experimental treatment. The final values of maximal oxygen consumption, measured after the experiment, were not also statistically different as those before the experimental treatment.

Keywords: *students, experimental groups, training models, aerobic abilities, coefficient of variation*

INTRODUCTION

As the consumption of oxygen, according to the results of the last studies, is considered the most significant determinant of the efficiency in the activities of aerobic character, which dominates in the cross country races, the assessment for the maximal oxygen consumption of each respondent has been done.

In order to estimate maximal oxygen consumption, previously described indirect non-laboratory method was used, which is suitable for mass use. The obtained values are expressed in milliliters per kg of body weight consumed per minute.

This study encompassed the sample of 151 male respondents, the students of Faculty of Physical Education in Pristina, aged 20 years, who were divided into three experimental groups. These groups were unified by the criterion of used variables.

RESULTS

Initial values of the oxygen consumption

The obtained distribution of results for entire sample as well as for the subsamples defined by the training model, show that the empirical distribution is significantly closer to the theoretical normal distribution.

As for the middle values, it can be concluded that the results are slightly above the average population standards. Since the obtained histogram results are almost ideally symmetrical, it is hard to say that somewhat higher average values are the result of extremely high values achieved by active athletes. The homogeneity of the entire sample of respondents also confirms very low values of the coefficient of variation.

Final values of the oxygen consumption

The estimation of oxygen consumption was done even after the experimental treatment with the previously described non-laboratory procedure. The obtained values are expressed in milliliters per kg of body weight consumed per minute.

The obtained distribution of results for the

Table 1. The distribution of results for the entire sample of respondents obtained by measuring the maximal oxygen consumption according to Von Dobeln

Class	Interval	Frequency	Relative frequency (%)
1.	40,0 – 46,2	18	11,921
2.	46,2 – 52,4	27	17,881
3.	52,4 – 58,6	60	39,735
4.	58,6 – 64,8	29	19,205
5.	64,8 – 71,0	17	11,258

Table 2. The distribution of results obtained by the method Of measuring maximal oxygen consumption according to Von Dobeln, for the subsamples of respondents who used continuous, discontinuous and combined training model.

Class	Continuous	Discontinuous	Combined
1.	4	7	7
2.	14	6	12
3.	7	21	27
4.	18	8	3
5.	5	8	4

Table 3. Descriptive statistical data on maximal oxygen consumption for the entire sample of respondents

Parameter	Maximal oxygen consumption according to Von Dobeln (ml x kg - 1 x min -1)
Average result (M)	55,404
Minimal consumption (min)	40
Maximal consumption (max)	70
Standard deviation (S)	7,037
Coefficient of variation	12,702

Table 4. The distribution of results for the entire sample of respondents obtained by the method of measuring maximal oxygen consumption according to Von Dobeln

Class	Interval	Frequency	Relative frequency (%)
1.	43,0 - 50,4	11	7,285
2.	50,4 – 57,8	27	17,881
3.	57,8 – 65,2	67	44,371
4.	65,2 – 72,6	35	23,179
5.	72,6 – 80,0	11	7,285

entire sample as well as for the subsamples defined by the training model has shown that the empirical distribution even this time is significantly closer to the theoretical model of normal distribution (Gauss).

Table 5. The distribution of results obtained by the method of measuring maximal oxygen consumption, for the subsamples of respondents who used continuous, discontinuous and combined training model

Class	Continuous	Discontinuous	Combined
1.	5	4	7
2.	14	8	12
3.	15	20	27
4.	12	10	3
5.	2	8	4

Table 6. Descriptive statistical data on maximal oxygen consumption for the entire sample of respondents

Parameter	Maximal oxygen consumption
Average result (M)	61,629
Minimal consumption (Min)	43
Maximal consumption (Max)	79
Standard deviation (S)	7,214
Coefficient of variation (V%)	11,706

Table 7. Initial values of the maximal oxygen consumption with the key results of the variance analysis

Training model	M	S	F - test
Continuous	56,521	6,697	2,096
Discontinuous	55,980	7,577	P=0,1266
Combined	53,894	6,655	P=0,1266

Table 8. Final values of maximal oxygen consumption with key results of the variance analysis

Training model	M	S	F - test
Continuous	62,521	7,005	1,21
Discontinuous	62,060	8,009	P= 0,3012
Combined	60,415	6,553	P=0,3012

As for the middle values, it can be said that the results were even this time more prominent than the average population standards. As regards the obtained histogram results are almost ideally symmetrical; it can be confirmed for certainty that those higher average values are the result of systematically higher values achieved by certain active athletes encompassed by this sample of respondents who are active students of the Faculty of physical education.

CONCLUSION

Most previous studies have interpreted the maximal oxygen consumption as the most significant determinant of the physical working capability, especially with that kind of burden that can be seen during cross country race. This is the so-called aerobic type of burden.

Bearing these facts in mind, the maximal oxygen consumption was also measured before the experimental program applied in this study. The basic goal of these measurements is to determine whether these experimental groups differ among themselves in regard to this most important physiological parameter. Thus, the absence of significant differences would guarantee the uniformity of the groups and the possibility of later reliable deduction.

The obtained statistical indicators have confirmed good selection of the subsamples to be studied, since statistically significant differences weren't found regarding maximal oxygen consumption before the experimental treatment. Therefore, the subsamples were quite uniformed thus avoiding any different aerobic abilities before the experiment to be shown as parasite factors during later deduction and result generalization.

The final values of maximal oxygen consumption, measured after the experiment, were not also statistically different as those before the experimental treatment.

The established relations clearly indicated the efficiency of all three applied training models, but due to unchanging quantitative relations between average values of the subsamples before and after the experimental treatment, it was not possible to conclude what training model was the most effi-

cient and to what extent. To solve this dilemma, it was possible only after comparing the results of final and initial measuring of maximal oxygen consumption.

The continuous training model has positively affected the increase of maximal oxygen consumption. The continuous training model has also positively affected the increase of maximal oxygen consumption.

The calculated statistical data have completely aligned with the results of the previous studies in which the maximal oxygen consumption was emphasized as the main determinant of efficiency in the athletic cross country race. So, of all considered physiological parameters, only maximal oxygen consumption can be attributed a significant predictor value during monitoring and predicting the results achieved in athletic cross country race.

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ИНИЦИЈАЛНИ И ФИНАЛНИ ВРЕДНОСТИ ЗА ПОТРОШУВАЧКАТА НА КИСЛОРОДОТ ПРИ РАЗЛИЧНИ ТРЕНАЖНИ МЕТОДИ КАЈ КРОС-ТРКАЧИТЕ

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(Прейходно соопштение)

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Апстракт

Испитувањето е спроведено на примерок од 151 испитаник од машки пол, студенти по физичка култура на возраст од 20 години. Примерокот беше поделен на три експериментални групи. Групите беа изедначени според прешираните варијабли. За проценување на максималната потрошувачка на кислородот користена е индиректната лабораториска метода која е поволна за масовна употреба. Потрошувачката на кислородот е измерена пред примената експерименталната програма на испитувањето. Добитите статистички покажатели го потврдија оправданиот избор на примерокот на испитаниците, затоа што пред примената експериментален прејман во поглед на максималната потрошувачка на кислородот, меѓу нив не е утврдена статистички значајна разлика. Финалните вредности на таа потрошувачка кои се утврдени по експерименталната постапка, исто така не се разликуваа статистички значајно.

Клучни зборови: *студенти, експериментални групи, модели на тренинг, аеробна способност, коефициент на варијација*