

INITIAL AND FINAL VALUES OF THE HEART RATES OF THE CROSS COUNTRY ATHLETES WITH DIFFERENT TRAINING METHODS

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(Preliminary communication)

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Abstract

This survey encompassed the sample of 151 male respondents, students of the Faculty of physical education in Pristina, aged 20 years, who were divided into three experimental groups. These groups were unified by the criterion of variables used. The distribution of results obtained by measuring the pulse difference when resting and immediately after the load/exercising, has not significantly changed compared to the initial status. Consequently, it can be concluded that the respondents had slightly higher heart rates than it was expected for the type of burden present in the athletic cross country races.

Keywords: *students of sport, kinesiology experiment, continuous method, discontinuous method, combined method, initial measurement, final measurement, physical workload, analysis of variance*

INTRODUCTION

According to general methodological approach, this study is longitudinal in character and it is defined as an experiment with parallel groups, all three of them being experimental groups.

The heart rate values have been studied through three cardiovascular parameters: resting heart rates, heart rates after burden and the difference between these two pulse values. All three parameters of the heart rates are measured within a minute.

This survey encompassed the sample of 151 male respondents, students of the Faculty of physical education in Pristine, aged 20 years, who were divided into three experimental groups. These groups were unified by the criterion of variables used.

Initial values of the heart rates

Three cardiovascular parameters have been used: first from the point of the entire sample and then from the point of subsamples which were defined in terms of training models.

All three distributions of results obtained for the entire sample of respondents indicate that there is a slight deviation from the normal standard distribution. Interestingly, within all three parameters of the heart rates, the intervals with higher values had higher rates

than the intervals with lower values. This slight dominance of higher values of heart rates was a bit unexpected, given that this selected sample of respondents is supposed to have higher cardiovascular capabilities and therefore lower values of heart rates and recovery. While the higher values of resting heart rates may be to same extent explained by increased excitement caused by the importance of measuring, thus the unexpectedly higher values can only be explained by a lower level of physical working

Table 1. Distribution of results for the entire sample of respondents which was obtained by measuring the resting heart rates

Class	Interval	Frequency	Relative frequency (%)
1.	52 - 61	34	22,517
2.	61 - 70	23	15,232
3.	70 - 79	74	49,007
4.	79 - 88	15	9,934
5.	88 - 97	5	3,311

Table 2. Distribution of results obtained by measuring the resting heart rates for the subsamples of respondents who used continuous, discontinuous and combined training

Class	Continuous	Discontinuous	Combined
1.	14	12	12
2.	4	8	22
3.	4	16	7
4.	22	11	8
5.	4	3	4

Table 3. Distribution of results for the entire sample of respondents which was obtained by measuring the heart rates after burden

Class	Interval	Frequency	Relative frequency (%)
1.	120,0 – 138,8	5	3,311
2.	138,8 – 157,6	14	9,272
3.	157,6 – 176,4	63	41,722
4.	176,4 – 195,2	54	35,762
5.	195,2 – 214,0	15	9,934

Table 4. Distribution of results obtained by measuring the heart rates after burden for the subsamples of respondents who used continuous, discontinuous and combined training models

Class	Interval	Frequency	Relative frequency (%)
1.	4	2	3
2.	10	7	10
3.	16	14	24
4.	12	24	11
5.	6	3	5

Table 5. Distribution of results for the entire sample of respondents obtained by measuring the difference between the resting heart rates and those when exercising

Class	Interval	Frequency	Relative frequency (%)
1.	54,0 – 72,2	9	5,960
2.	72,2 – 90,4	26	17,219
3.	90,4 – 108,6	56	37,086
4.	108,6 – 126,8	45	29,801
5.	126,8 – 145,0	15	9,934

Table 6. Distribution of results obtained by measuring the difference between the resting heart rates and those ones when exercising, for the subsamples of respondents

Class	Continuous	Discontinuous	Combined
1.	4	4	5
2.	16	4	13
3.	6	17	19
4.	12	20	13
5.	10	5	3

Table 7. Descriptive statistical data on heart rates per minute for the entire sample of respondents

Parameter	Resting heart rates	Heart rates after exercising/load	Difference
M	70,444	175,03	104,609
Min	52	120	54
Max	96t	213	144
S	9,439	16,843	18,748
V (%)	13,399	9,622	17,92

Table 8. Final values of resting heart rates with key results of variance analysis

Training model	M	S	F - test
Continuous	63,208	8,720	4,706
Discontinuous	64,880	7,142	P= 0,014
Combined	68,113	8,642	P= 0,014

Table 9. Final values of heart rates measured after burden with key results of variance analysis

Training model	M	S	F - test
Continuous	166,708	17,722	0,501
Discontinuous	163,300	17,354	P= 0,6067
Combined	165,208	15,658	P= 0,6067

Table 10. Final values of difference between resting heart rates and those ones after burden with key results of variance analysis

Training model	M	S	F - test
Continuous	103,5	18,200	1,721
Discontinuous t	98,42	17,734	P= 0,1824
Combined	97,094	18,449	P= 0,1824

capability than expected. It is obvious that the tested students of the Faculty of physical education do not significantly differ in physical and functional abilities than the average student population.

As for the descriptive statistical parameters of the heart rates, it can be said that they are in the scope of standard values of healthy individuals, except in certain cases, and they do not significantly deviate from average values. The low coefficients of variation indicate that all obtained values are very homogeneous.

Relation between the heart rates of the subsamples at the final measuring

The relation of the heart rate parameters defined within the initial measurement also remained unchanged after the final measurement. Again, statistically significant difference was established only within the resting heart rates (Table 8), while the other two values (heart rates after the burden and the pulse difference) were not significantly different (Table 9 and 10).

As for the numerical values of the average results, all three variables had lower values compared to the initial measurement. This was expected since most previous studies have indicated the decrease of the heart rates for the same burden as a result of systematic training.

The established relations indicated the efficiency of all three used training models (continuous, discontinuous and combined), but due to the unchanging quantitative relations between the average values of the subsamples before and after the experimental treatment, it wasn't possible to conclude what training model was the most effective and to what extent. The solution for this dilemma was only possible after comparing the results of final and initial measuring.

CONCLUSION

The distribution of results obtained by measuring the pulse difference when resting and immediately after the burden/exercising, has not significantly changed compared to the initial status. Consequently, it can be concluded that the respondents had slightly higher heart rates than it was expected for the type of burden present in the athletic cross country races.

The distribution of results for the resting heart rates, within the entire sample of respondents, showed considerable deviation from the standard, which can be explained by smaller excitement having already familiar training task. The distribution of results obtained by measuring the heart rates after the burden/exercising, has not significantly changed compared to initial measuring. The distribution of results obtained by measuring the difference between resting heart rates and those ones after the burden/exercising, hasn't significantly changed as well, compared to the initial status.

As for the descriptive statistical parameters of the heart rates, it can be said that despite of some improvements, they were within standard values of healthy individuals except in certain cases; they didn't deviate from the average values even in the final measuring.

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ИНИЦИЈАЛНИ И ФИНАЛНИ ВРЕДНОСТИ НА СРЦЕВАТА ЦЕНА НА РАБОТА СО РАЗЛИЧНИ ТРЕНАЖНИ МЕТОДИ КАЈ КРОС - ТРКАЧИТЕ

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(Прейходно соопшћение)

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Апстракт

Истражувањето е реализирано на 151 испитаник од машки пол, студенти на Факултетот за физичка култура во Приштина, на возраст од 20 години кои беа

поделени во три експериментални групи со слична големина. Групите беа изедначени според критериумот на третираните варијабли. Податоците од истражувањето беа обработени со анализа на варијансата. Дистрибуцијата на добиените резултати од пресметките за разликите на пулсот во мирување и непосредно по оптоварување, не се промени битно во однос на иницијалниот статус. Според тоа, констатирано е дека испитаниците „плаќале незначително поголема цена на работата од онаа која беше очекувана за видот на оптоварувањето кое е карактеристично за атлетскиот крос.

Клучни зборови: *студентски постојење, кинезиолошки експеримент, континуирана метода, дисконтинуирана метода, комбинирана метода, иницијално мерење, финално мерење, телесно оптоварување, анализа на варијанса*

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