JOURNAL OF INTERNATIONAL ACADEMIC RESEARCH FOR MULTIDISCIPLINARY
Impact Factor 1.625, ISSN: 2320-5083, Volume 3, Issue 2, March 2015

COMPARISON OF RESPIRATORY INDICES AMONG TRAINED AND UNTRAINED INDIVIDUALS AGED 14 – 15 YEARS

DR. FATBARDHA KOVAÇI*
JANI NANO**

*Professor, Faculty of Movement Sciences, Sports University of Tirana, Tirana, Albania
**Physical Education Teacher, "Mihal Ekonomi", Durrës, Albania

ABSTRACT

Nowadays, recreational parks are being replaced by play station stores, active games around the block are outdated, and rather computer games at home are in. Smart phones are becoming increasingly popular among children, restricting the time children spend playing outdoors. Sport facilities at school are still deficient and those already present are out of reach for pupils in their free time. The aim of this study is to evidence the deteriorating differences in physical performance variables, in order to increase the participation of children in recreational physical activities or sport activities. This cross sectional study was carried out on 24 boys aged 14 – 15 years. Participants were categorized in two groups. Participants in the first group are active members of a boxing sport club, while those in the second group had never been part of any sport club. 12 minute Cooper test scores for the trained participants are satisfying. By comparison with the reference values, it resulted that the test scores for the first group ranged from "good" to "very good". Regarding untrained participants, only one participant achieved a good result. The other untrained participants' scores range from "bad" to "very bad". After being juxtaposed with the physical performance of their trained counterparts, as well as with the image they projected, the interest for engagement in physical activities was awakened. 2 untrained participants were willing to enroll in boxing sport clubs, while 2 others asked to be tested again for their physical performance skills after a preparatory period. Therefore, a successful approach to awaken the interest for engagement in sport activities would be by creating healthy sport images, educating love and respect for the heroes of elite sport and organizing occasional visits of pupils to elite sport clubs during their training sessions.

KEYWORDS: 12 minute Cooper Test, trained vs untrained

1. INTRODUCTION

Our "modern" society is being affected by a various number of concerning problems such as obesity, spine deformities, fatigue etc. If a comparative observational survey is being made between children now days and their coevals 25 years ago, alarming conclusions are drawn.

Recreational parks are being replaced by play station stores, active games around the block are outdated, and rather computer games at home are in. Smart phones are becoming increasingly popular among children, restricting the time children now days spend playing outdoors. Sport facilities at school are still deficient and those already present are out of reach for pupils in their free time. In a few words, an active life is being rejected for a new sedentary one.

In our opinion, the main problem is facing the new mentality rather than dealing with the old-fashioned infrastructure. The aim of this study is to evidence the deteriorating differences in physical performance variables, in order to increase the participation of children in recreational physical activities or sport activities.

2. Material and methods

2.1 Participants

This cross sectional study was carried out on 24 boys aged 14 – 15 years. Participants were categorized in two groups. The first group consisted of 12 boys, who are active members of the boxing sport club Teuta (Durrës), while the second group was composed by 12 boys, who were pupils at the "Mihal Ekonomi" non public school. Participants in the second group had never been part of any sport club. Prior to the beginning of the study all participants were familiarized with the 12 minute Cooper test. On the testing day all participants present themselves in optimal health conditions.

The study protocol was approved by the Sports University of Tirana and informed consent was obtained from all participants and their parents.

2.2 Data Collection

The testing procedure, that is the 12 minute Cooper test, has been conducted under normal environmental temperatures and conditions which are defined as follows:

- Temperatures range: 10°C (50°F) and 25°C (75°F).
- Maximal humidity limit: 75%.

The 12 minute Cooper test consists in trying to cover as much distance as one can in 12 minutes. On the command "Start", participants began running. The participants were encouraged to push themselves as hard as they could to maximize the distance covered. The total distance covered in 12 minutes by each participant was recorded.

To estimate VO_{2max} (in ml/kg/min) from the distance score the following formula was used:

$$VO_2\ max = \frac{d_{12} - 505}{45}$$

2.3 Statistical Analysis

Test scores for the first group are presented on table A1, while those for the second group are presented on table B1. The average test scores for the first group (table A2) were compared to those of the second one (table B2). For interpreting the results obtained, reference values for Cooper test at junior athletes (table C1) were used.

Table A1: First Group Test Scores (Boxing Sport Club Teuta)

Subject ID	Age (years)	Distance Covered (meters)	VO_{2max} (ml/kg/min)
1.	14	2900	53.2
2.	14	2600	46.5
3.	14	2800	51
4.	14	2700	48.7
5.	14	2700	48.7
6.	14	2600	46.5
7.	15	2850	52.1
8.	15	2900	53.2
9.	15	2500	44.3
10.	15	2900	53.2
11.	15	2800	51
12.	15	2700	48.7

Table A2: Average Scores for the First Group

Trained Participants	12 minute Cooper Test	
	Distance Covered (meters)	VO_{2max} (ml/kg/min)
Average Score (14 years)	2716	49.1
Average Score (15 years)	2775	50.4
Total Score Average	2745.8	49.75

Table B1: Second Group Test Scores (“Mihal Ekonomi” Non public School)

Subject ID	Age (years)	Distance Covered (meters)	VO_{2max} (ml/kg/min)
13	14	2000	32.2
14	14	1700	26.5
15	14	2350	41
16	14	1800	28.8
17	14	2400	42.1
18	14	2000	32.2
19	15	2250	38.8
20	15	2400	42.1
21	15	1700	26.5
22	15	2200	37.7
23	15	1850	29.9
24	15	2200	37.7

Table B2: Average Scores for the Second Group

Untrained Participants	12 minute Cooper Test	
	Distance Covered (meters)	VO_{2max} (ml/kg/min)
Average Score (14 years)	2041	33.8
Average Score (15 years)	2100	35.45
Total Score Average	2070.8	34.6

Table C1: Reference values for 12 minute Cooper test (Athletes & Juniors)

Cooper test (Athletes & Juniors)						
Age	M/F	Very good	Good	Average	Bad	Very bad
13-14	M	2700+ m	2400 - 2700 m	2200 - 2399 m	2100 - 2199 m	2100- m
	F	2000+ m	1900 - 2000 m	1600 - 1899 m	1500 - 1599 m	1500- m
15-16	M	2800+ m	2500 - 2800 m	2300 - 2499 m	2200 - 2299 m	2200- m
	F	2100+ m	2000 - 2100 m	1700 - 1999 m	1600 - 1699 m	1600- m

3. Results

Test scores for the trained participants are satisfying. By comparison with the reference values presented on table C1, it resulted that the test scores for the first group ranged from “good” to “very good”. Specifically, regarding the participants aged 14; four subjects achieved good results, while the two others achieved very good ones. Participants aged 15 achieved a 55 meter increase in their total score average compared to participants of the same group aged 14. The maximal score achieved by the subjects of the first group is 2900 meter corresponding to a maximal oxygen value equal to 53.2 ml/kg/min, while the minimal score

for these subjects resulted 2500 meter corresponding to a maximal oxygen value equal to 44.3 ml/kg/min.

Regarding untrained participants, only one participant (subject ID 17) achieved a good result. The other untrained participants' scores range from "bad" to "very bad". At first glance, the untrained participants aged 15 years show a slight advantage when compared to untrained participants aged 14, but by comparison with the reference values presented on table C1, it resulted that their test scores range from "bad" to "very bad". Only one participant among the abovementioned achieved an "average" result. The maximal score achieved by the subjects of the second group is 2400 meter corresponding to a maximal oxygen value equal to 42.1 ml/kg/min, while the minimal score for these subjects resulted 1700 meter corresponding to a maximal oxygen value equal to 26.5 ml/kg/min.

4. Discussion

The comparisons among trained and untrained participants showed that untrained subjects' results are rather disappointing. Their total score average besides being interpreted "very poor" stands 700 meter lower than the total score average of their trained counterparts, or equivalent to 33.8% of the trained participants' performance. If obtained scores were to be interpreted without taking into consideration the relative satisfying results of subjects with ID 3, 5 and 8; their differences would be more obvious. The best result of untrained participants is 100 meters lower than the poorest result of trained participants and 350 meters lower than their average score. In order to achieve the minimal score of trained participants, the untrained subject that achieved the best score would necessitate a 4.2% improvement of his performance, while to achieve the trained participants' group average score, he would necessitate a 15% improvement. The untrained subject that achieved the poorest score would necessitate a 62% improvement of his performance, as his score is 1050 meter lower than the total average score of trained participants.

5. Conclusions

- Trained participants achieve better results than untrained ones.
- Untrained participants whose ID is 15, 17 and 20 should be encouraged to participate in competitive sport activities, because their results are outstanding for untrained individuals.

- After being juxtaposed with the physical performance of their trained counterparts, as well as with the image they projected, the interest for engagement in physical activities was awakened. 2 untrained participants were willing to enroll in boxing sport clubs, while 2 others asked to be tested again for their physical performance skills after a preparatory period.
- Even healthy and active individuals would benefit from active engagement in sport activities, in terms of lung function.
- A successful approach to awaken the interest for engagement in sport activities would be by creating healthy sport images, educating love and respect for the heroes of elite sport and organizing occasional visits of pupils to elite sport clubs during their training sessions.

6. References

1. Cooper, Kenneth H. - Aerobics. Bantam Books. ISBN 978-0-553-14490-1. - January 1969
2. Dibra F. – Atletika. Bazat e Stërvitjes Sportive, - Tiranë 2007
3. Thomas J., Nelson J. - Research Methods in Physical Activity, - 3rd ed. – Athens 2003
4. http://en.wikipedia.org/wiki/Cooper_test
5. http://en.wikipedia.org/wiki/VO2_max
6. http://www.brianmac.co.uk/vo2max.htm