

## **AEROBIC FITNESS OF PARENTS WHOSE CHILDREN ARE ON THE THRESHOLD OF ELEMENTARY SCHOOL**

by

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The purpose of this paper is to estimate the level of aerobic fitness of parents whose children are 6-7 years of age. The research was conducted on 88 fathers and 141 mothers at the age of 24-40. Aerobic fitness was evaluated by after effort capacity index of (cardiac contraction frequency) heart rate registered during one-minute after a 3-minute step-test. The logarithmic model was almost identical for fathers and mothers in the kinetic course of restitution. Comparing the results to the existing (only American) norms, barely satisfactory fitness level of both fathers and mothers was observed. This justifies the need to increase physical activity.

**Key words:** parents, aerobic fitness, step-test

### *Introduction*

Aerobic fitness (AF) reflects, among others, cardiovascular efficiency and cardiovascular diseases as the main cause of mortality. Many works show that risk factors of these diseases are lower among people with higher aerobic fitness (Blair et al. 1989, Bouchard et al. 1994). Such a correlation seems independent from other risk factors (Eriksson 1986, Haskell et al. 1992, Sobolski et al. 1987) and it is believed that aerobic fitness is significant for health state estimation (Przewęda 1996, Sharkey 1991).

High level of AF means more advantageous values of various biological indexes e.g. lower lipid concentration, lower blood pressure (Cooper et al. 1976, Slattery and Jacobs 1988) and more pro-health behavior such as higher physical activity (Kemper 1992, Raczek 1981, Shephard 1982). Higher AF also means better effort toleration of various intensity (Kozłowski et

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al. 1995). Such intensity is characteristic for children, so the fitter and active parents the better companions they are for children's games and plays. At the same time parents are models imitated by children.

Many risk factors come from childhood (Tell and Vellar 1988). One of them is physical activity which when low in childhood and adolescence may continue in adulthood (Dennison et al. 1988). AF is also highly associated with physical activity.

The research taken was to estimate the level of AF in a certain group of adults.

### *Material and methods*

Parents of 6-7 – year – old children on their elementary school threshold were subjected to research. The choice was made on account of four reasons. Firstly, the fact that the research was carried out 'on the occasion' of parents own children being tested at the Health and Child's Fitness Promotion Centre in Gdansk. This Center deals with 6-7 – year – old children. Joint examinations of parents and children were mobilizing and educational for both parties. It was the second reason of choice of these parents, who establish a specific group, considering the requirements of their children among which are motor activities (to keep company to and from school). Thirdly, there was hope that parents would have long-lasting effect on their children, also their pro-health behavior. Parents of higher AF level might have more real and efficient influence on their children. It seems that hypothesis needs justification. In Poland not only there is not any systematic monitoring of AF during the course of human ontogenesis, but many other positive health factors, either. Such a situation would last unless simple and cheap trials of their evaluation were undertaken. So, the fourth reason is contribution to the above-mentioned monitoring. Eighty-eight men (fathers) and 141 women (mothers) were tested (Table 1). Mothers, compared to fathers, visited the Center more frequently, so the fitness test was proposed every third mother and every second father. In case of refusal (there were few) the next person was asked to follow the test.

To evaluate the level of AF a 3-minute-step-test was applied. The step was 30.5 cm high and frequency of the exercise was set at 24 steps per minute. Post-exercise heart rate was registered in 5 s intervals, in a sitting position for 1 min., no later though than few seconds after the effort was completed. PE 3000 sport-tester was used in the test. According to the author (Kasch 1961), post-exercise heart rate average became a capacity index. Heart rate was registered after the first, second and the third minute

in the last 5 seconds. Test norms for adults between 18 and 65 years of age and over were published in 1989 (Golding et al. 1989) and the test itself was included in the set of tests used by YMCA. From the point of view of public health the test is sufficient enough to define the AF level, which in its definition contains the process of restitution (Kozłowski et al. 1995).

Statistical calculations were made with the use of STATISTICA 5.0 package. To find differences between groups (women vs. men) one-way ANOVA was applied.

### *Results and discussion*

General information about fitness level via heart rate value is shown in Table 2 and Figure 1. Exercise (HR1, HR2, HR3) and post-exercise heart rate among mothers was considerably higher than among fathers (Table 2). Successive HR values during restitution were also higher among mothers (Fig. 1). Sexual differences of the above-mentioned HR in absolute values equaled to 10 beats/min. It is consistent with the same difference in HR between men and women during submaximal efforts of e.g. 50%  $VO_{2max}$  (Kozłowski et al. 1995).

Table 1. Baseline characteristic of tested subjects – mean values (SD)

Parents	N	Age (years)	Body height (cm)	Body weight (kg)	BMI (kg/m <sup>2</sup> )
Fathers	88	34,7±3,78	177,6±5,66	79,3±12,07	25,13±3,52
Mothers	141	32,8±4,26	164,5±4,41	59,1±8,69	21,82±2,79

Table 2. Exercise and post-exercise heart rate (beat/min) of tested subjects - mean value (SD)

Group	Exercise			Post-exercise
	HR1	HR2	HR3	
Fathers	121,2±11,8	127,8±12,7	133,0±13,9	106,9±13,5
	p≤0,000001	p≤0,000001	p≤0,000001	p≤0,0000001
Mothers	131,5±11,4	141,3±12,1	146,7±13,0	117,1±15,6

The step-test itself was a submaximal effort. The course of function (Fig. 1) shows that among various models (linear, logarithmic, exponential, polynomial of higher degree) the best, which “fits” the measured points, is the logarithmic one. The character of the course of restitution was typical – fast at the beginning, slow later (Kozłowski et al. 1995). Kinetic course of rest changes is almost identical for men and women, which is shown by the

function (Fig. 1). Significant differences in measured points (R1, R4, R12), which were arbitrary chosen to calculate differences between men and women, were preserved. Unfortunately no population data describing the course of restitution after similar effort at this age were found.

Sex difference range in the analyzed values of pulse rate is typical and approximate to a commonly known difference in HR at rest. To some extent the evaluated fitness level among men was determined to a large extent by a high body mass index (Table 1). Since high correlation between aerobic fitness level and body mass is well known (Cooper et al. 1976), the latter one influencing effort intensity during step – test might have effected the value of fitness index among some of the tested men.

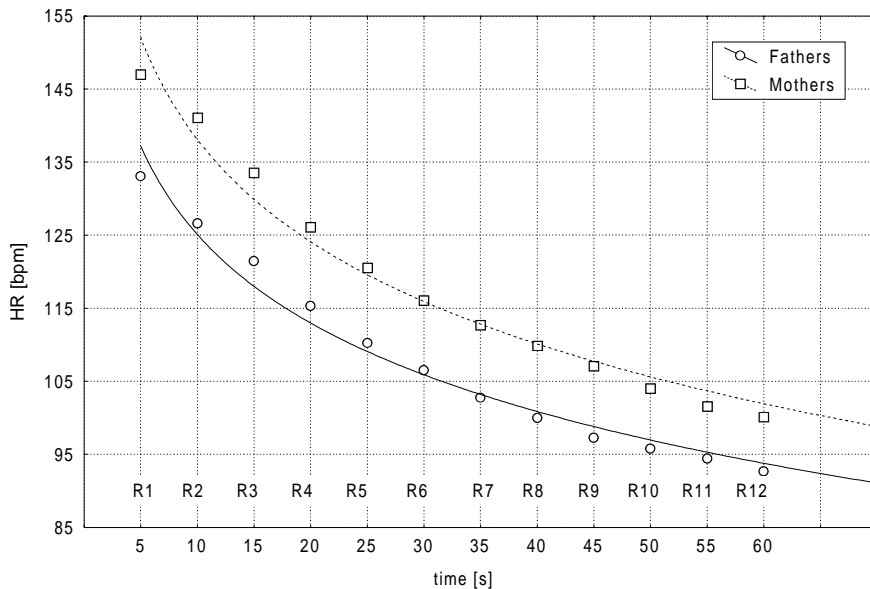


Fig. 1. The course of restitution (HR after effort) among fathers and mothers (R1 - R12 – successive records of HR recorded every 5s)

Considering all the above it might be assumed that apart from confirmed, typical differences in the reaction of cardiovascular system, the fitness index of fathers was higher than that of mothers. Comparing the obtained results with accepted norms of that index (Golding et al. 1989) it was observed that the aerobic fitness level of mothers and fathers was low, just satisfactory. This fact was used to indicate ways of improving this level by increasing physical activity. Low fitness level of parents means only satisfactory toleration of the physical effort. It may be connected with their

low physical activity as well, which as it is known, significantly affects aerobic fitness (Kozłowski et al. 1995). Results of our research cannot be compared with physical activity of the tested group because this activity was not the subject of the research. Although, taking into consideration the level of physical activity of another group of parents (parents of 6-7 – year – old children from Gdańsk (Drabik and Drabik 1998) it may be concluded that their activity is low as well.

### *Conclusion*

The obtained results indicate a rather low level of aerobic fitness of parents aged 24-40. This justifies the need for increased physical activity. The first goal of State Health Program is then by all means justifiable.

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