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The differences in chosen spirometric values of young judo competitors against of the control group as one of the patterns to the improvement the health of the young generation

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Abstract:
Poor physical activity in the young generation in the subsequent years results in problems of the majority of the society and at the same time in the increase of budget expenses on healthcare. Therefore, despite creating school programs aimed at improving the physical condition some exemplars taken from various sports disciplines taken up by young people should be presented with their pro-health effect.
Leading junior judo competitors and people at similar age and with similar somatic parameters who were not involved in sports were selected and examined spirometrically.
Despite young age and still unfinished personal development of the young people tested in both groups, the results in the group of judo competitors were significantly higher and showed a significant correlation to some of the somatic value.
The aim of these study was presentation of the chosen differences in the spirometric values between the young judo competitors and persons who were not involved in sports.
It shows as sport realized as judo can be the main factor (and pattern) motivating for physical activities.
It is also important: ease of spirometric tests, the values of self-defense in judo and visible development of the respiratory system. Depending on the results of spirometry indication of some somatic features may be an additional motivating factor.

Introduction:

Public health is a resultant of many components of social behaviors in the society. One of them is one's care about harmonious development of the young generation. The care itself should be shown in education, culture, psychology, health care, pathology prevention as well as physical fitness of the young generation.

One of the directions in the search were direct measurements of physical activity in the young generation and combining it with different kinds of attitudes, though the results were not always direct.

Latvian examinations taken up with the use of "Eurofit" test on more than 10 thousand of young people in the school age allowed creating reference values for the examined group of young people. The examination enabled a comparison of physical

fitness of young people in the whole of Eastern Europe [Sauka *et al*. 2011]. Therefore, it can be stated that the aim of unification was achieved.

However, 3 years of similar examinations in Poland demonstrated positive influence of sports taken up in free time on the health factors [Bronikowski, Bronikowska 2011].

The examinations of young people aged between 14 to and 18 also presented a satisfying result when it comes to the physical fitness both moderate and intensive (suggesting the promotion of much intensity). In these tests such martial arts as judo and karate appeared for the first time as an opportunity to improve physical activity [Levin *et al*. 1999].

In this trend of searching we can place the direct examinations of judo competitors connected with their level of being trained with the usage of elements of a typical judo training in the connection with biochemical blood pattern [Azevedo *et al*. 2007].

According to the other research the three-year training load of an aerobic and anaerobic-aerobic metabolism nature caused a significant increase in the maximal anaerobic power and overall values of the young judoists. The training load during those three years had a positive effect on the biological age and anaerobic capacity of the young judokas [Laskowski, Smaruj 2008].

Similar results were also gained examining the students of high schools in New Zealand on their favorite places to take up a physical activity. Open public spaces were the most frequently counted (nearby beach and parks were the most frequent answers). The industrial area, the harbour, other schools and cemeteries were the least frequent answers. In these examination it was proved that the combination of environmental and social factors is meaningful and may play encouraging as well as discouraging role in the process of taking up physical activities by young people [Rehrer *et al*. 2011].

Very interesting examinations on payments for physical activities were taken up in Sweden focusing on the population of people with different intensity of physical activity. The relationships between the economic factors, education and the BMI index were examined.

The results of the examination confirmed greater will in paying for "health for prescription" of well educated people with better financial status and with higher BMI index [Romé *et al*. 2010].

Similar examinations on psycho-social working conditions and physical activity depending on education in Scandinavia confirmed the need of further examinations of the relationship between psycho-social working conditions (often dependent on education) and spending free time on physical activities [Ali, Lindström 2006].

In the mentioned subject matter of the research there is also a place for the topic taken up in Australia and continued in the end of the 90's in Singapore based on the usage of the sports activities to improve the quality of life of culturally isolated, undervalued, young people endangered with suicide epidemic.

This program was successfully put into practice in more than 150 institutions for teenagers in Australia and 24 in Singapore [Tester, Watkins, Rouse 1999].

The other direction for the researchers was the health aspect of physical activity.

For instance the mentioned aspect was present in the examinations of Scandinavian researchers focused on the analysis of the relationship between changes in physical activity and changes in cholesterol concentration and changes in weight in the representative group of the group of general population [Salonen, Tuomilehto, Puska 1981].

The Swedish studies of the population on obesity were taken up in 2004 and 2005 and were based on the data from 1980 to 1990. According to the research the number of obese people grew from 35% to 52%. At present Sweden seems to gain the balance in the issue of overweight and obesity. However, the further discussion on the lifestyle, diet and physical activity is needed in the Swedish healthcare system [Johansson 2010].

Another attitude to the issue of the physical activities was presented by Danish researchers. They took vast population of research on the ratings of the behavior on the 6 main types of cancer with the intensity of the physical activity. The researches showed the meaningful negative correlation only for the ovary cancer. In the other cases of the cancer there was no relation noticed [Schnohr *et al*. 2005].

A similar health aspect is presented in the researches on the level of the fatty tissue and the risk of heart and blood vessel diseases depending from the physical activities. The examinations were taken on about 27 thousands of women and men and they presented that the risk of heart and blood vessel diseases was increased by the physical activities among people with the increased percentage level of fatty tissue.

It was also claimed that the high level of fatty tissue was a stronger factor of risk among women, but the rise of the risk of heart and blood vessel diseases was strictly connected with the high level of fatty tissue and was a result of the decrease of the physical activity [Calling *et al*. 2006].

There are also the results of the examinations

of Greek young people on the blood pressure and the frequency of heart action that shown a positive result of physical activity administered on the balanced level [Tsiachris *et al*. 2011].

The cross-sectional researches of many changeable macro-environmental factors with physical activity (its decrease) were also shown to 27 UE countries. The authors of the researchers presented statistically crucial relationship between the physical activity and many economical data as GDP (gross domestic product), the expenses on the health care, the availability of the precise food products (vegetables/fats) [Van Tuyckom 2011].

The examinations on judo competitors can be also quoted when it comes to the aspect of health of young generation. According to them apart from the result in the practiced sport there are also meaningful pro-health behaviors.

The example examinations connected with the intentional weight loss and its fast restitution combined with judo practice and the tests on cycloergometer did not show the correlation with the physical efficiency and the change of biochemical parameters [Artioli *et al*. 2010].

The other example of the care of health are the researches on the injuries in the training and in judo fights on the work of the system of the posture control [Perrot *et al*. 2000] which shown the satisfying result in adaptation system of judo competitors starting the training after the rehabilitation process.

Based on the above presented literature showing various possibilities to improve the physical health of the young generation the authors present their research purpose as:

Training judo as one of the patterns to improve the respiratory system of young generation - based of the spirometric values.

Material and methods

The 31 of the leading Polish junior judo competitors (age 18,2 ± 1,02) took part in the spirometric tests carried out in September and October 2010, and 30 of men (age 18,4 ± 1,24) who do not train (students from The Team of Woodcraft Schools in Bydgoszcz).

The condition for the judo competitor to be qualified to the examination was to gain at least the 5th position in The Polish Championships Competition or The Polish Cup. The competitors from "Czarni" Bytom, AZS UKW Bydgoszcz, "Gwardia" Wrocław, "Juvenia" Wrocław, AZS Warszawa, "Gwardia" Koszalin, Akademia Judo Warszawa, AZS Uniwersytet Warszawa took part in the examination. The measurements were taken in a large aired room in the temperature of 20°C and the examined men declared good health state and the lack of the previous respiratory system diseases.

Firstly, the weight and height of the examined men were measured and the BMI index was stated. Next, the percentage content of the fatty tissue was measured with the use of the BF-300 device made by 'OMRON' and the mass of the active tissue was calculated using the pattern:

$$m_a = m_c - (m_c - \%fat.^* m_c) \quad \text{Eqn.1}$$

where:
m_a – mass of the active tissue
m_c – weight of the body
% fat – percentage content of the fatty tissue

The measurements of the movable of the chest on the maximum inhalation and exhalation of air were taken.

In each of the examined men the movable of the chest was counted and presented in percentage. The described factor was measured:

$$R = (\frac{O_1 - O_0}{O_1}) * 100 \quad \text{Eqn.2}$$

where:
R – the mobility of the chest
O_1 – chest measure on the maximum inhalation
O_0 – chest measure on the minimum exhalation

Finally, the measurements of the spirometry parameters were taken in which the Microlsb Ml 3500 spirometer was used. The following parameters were stated: VC (Vital Capacity), FVC (Forced Volume Vital Capacity), FEV_1 (Forced Expiratory Volume in 1 second) and PEF (Peak Expiratory Flow).

The statistic material is prepared with the use of "Statistica 5.0 - version" (parametric f –test for variances, parametric t-test for differences, graphs, the differences meaningful on the level $p< 0,05$, determination indicator - R^2),

Results

The anthropometric data divided into groups which are junior judo competitors and the control group presented in Table 1. It is worth noticing, that the parameters such as the age and BMI index are similar in both examined groups which means that both groups of men have the similar body build

Table 1. The anthropometric data of judo competitors (J) and control group (C).

Groups	Mass (kg)	Range	Height (m)	Range	BMI (kg/m²)	Range	Age (l)	Range
Experimental group n=31(J)	81,8* ± 15,81	51,50 - 114,50	1,81* ± 0,09	1,63 - 2,01	24,8 ± 3,56	18,81 - 31,44	18,2 ± 1,02	16,75 - 20,00
Control group n=30(C)	75,7* ± 11,29	56,00 - 105,00	1,77* ± 0,06	1,67 - 1,90	24,0 ± 3,58	19,38 - 37,65	18,4 ± 1,24	16,00 - 20,00

* the differences meaningful on the level p< 0,05 (the comparison of the same columns from Table 1)

Table 2. The results of the counted mass of the fatty tissue, the measurements of mobility of the chest and the measurements of the percentage of the content of the fatty tissue of the judo competitors group (J) and the control group (C)

Groups	% fatty tissue	Range	Mass of active tissue	Range	The mobility of the chest	Range
Experimental group n=31(J)	10,7* ± 5,64	4,20 - 21,70	72,5* ± 11,27	49,03 - 91,71	10,23* ± 1,53	7,14 - 13,19
Control group n=30(C)	13,4* ± 6,80	4,70 - 33,00	65,0* ± 6,59	53,37 - 81,00	9,59* ± 1,60	6,00 - 12,50

* the differences meaningful on the level p< 0,05 (the comparison of the same tables with Table 2)

Table 3. The results of the spirometric tests VC, FEV1, FVC, PEF of the judo competitors group (J) and the control group (C)

Groups	VC (dm³)	Range	FEV1 (dm³)	Range	FVC (dm³)	Range	PEF (dm³/min)	Range
Experimental group n=31(J)	5,47 ± 0,92	4,10 - 7,53	4,69* ± 0,80	3,44 - 6,87	5,42* ± 0,87	3,80 - 7,33	594,42* ± 91,61	399,00 - 824,00
Control group n=30(C)	5,10 ± 0,66	4,00 - 6,35	4,22* ± 0,56	3,27 - 5,52	4,84* ± 0,66	3,38 - 6,16	546,2,* ± 88,9	357,00 - 706,00

* the differences meaningful on the level p< 0,05 (comparing the same columns from Table 3)

and are in the similar ontogenetic stage, but they differ in a sports activity.

The results presented in Table 1 show that the age and the BMI index (describing the posture) are on a similar level both in the group judo competitors and the control group and the differences are not statistically meaningful on the level p< 0,05.

The following Table 2 and Table 3 present the results of the measurements of the content of the fatty tissue and the spirometric parameters in both examined groups.

The graph in Fig. 1 shows that vital capacity increases with the growth of the mass of the active tissue in both examined groups. In the group of judo competitors the relationship is on a high statistic level **(R^2=0,55)** and in the control group on the low statistic level **(R^2=0,28)**.

The graph in Fig. 2 shows that FEV_1 (Forced Expiratory Volume in 1 second) increases in the group of judo competitors with the growth of the mass of the active tissue. The relationship is statistically important on the high level **(R^2=0,55).** In the control group such a relationship does not occur.

The graph in Fig. 3 shows that FVC (Forced Volume Vital Capacity) increases in the group of judo competitors with the growth of the mass of the active tissue. The relationship is statistically important on the high level **(R^2=0,61**). In the control group such a relationship does not occur.

The graph in Fig. 4 shows that PEF (Peak Expiratory Flow) increases in the group of judo competitors with the growth of the mass of the active tissue. The relationship is statistically important on the high level (**R^2=0,44**). In the control group such a relationship does not occur.

Discussion and conclusion

Judo is an Olympic sport so in many countries it is subsidized by the state on a professional level. The survey of the scientific literature presented above confirms a great interest of judo population and the care of the public healthcare among the researchers.

One of the first pedagogically focused examinations on training judo in the process of

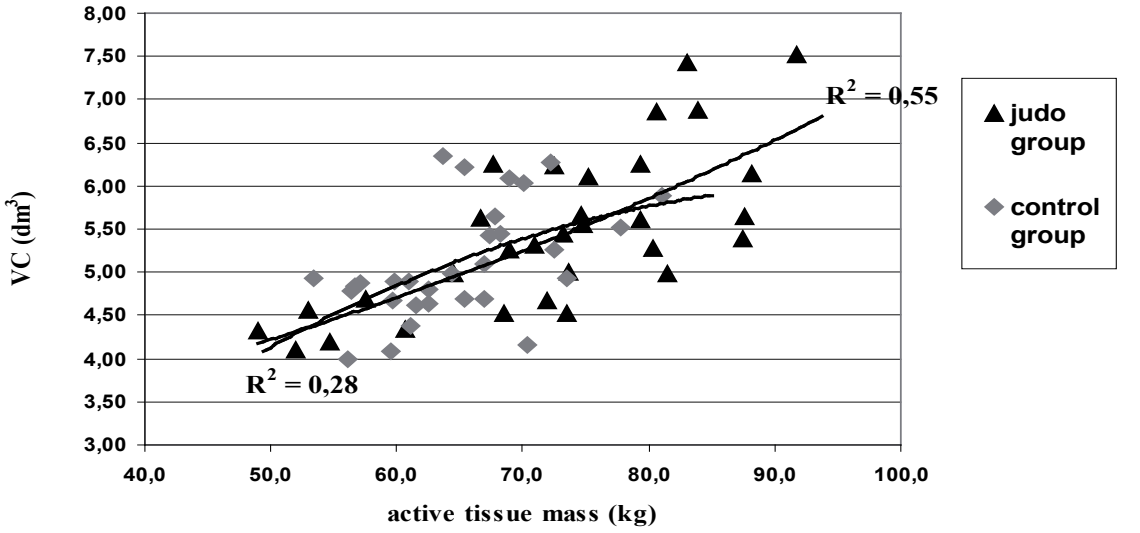

Fig. 1. The relationship of VC (Vital Capacity) in the function of the active tissue in both examined groups.

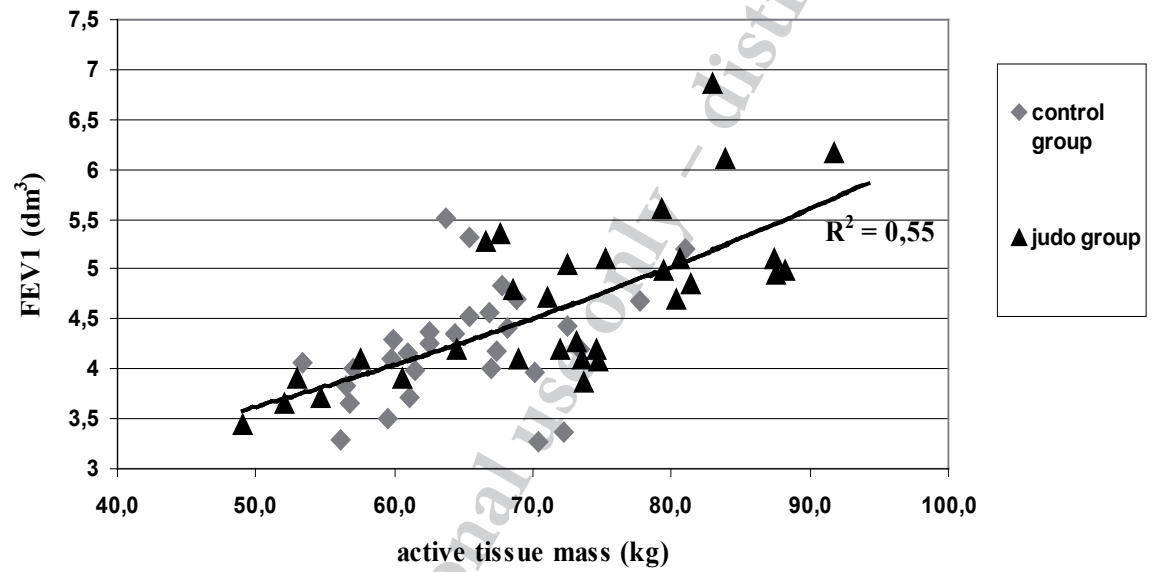

Fig. 2. The relationship of FEV_1 (Forced Expiratory Volume in 1 second) in the function of the mass of the active tissue in both examined groups.

physical education goes back to the 70s, and it should be remembered that pointing out the proper patterns is the pedagogy action [Pyecha 1971].

However, one of the newest surveys of literature connected with martial arts claims among other things that the examinations of judo, karate and taekwondo concentrate mainly on developing the sports abilities but the effects on heath are treated marginally.

It happens despite the fact that the training of presented martial arts is proved to have influence on physiology, morphology and immunology and should be the aim of the researches to help people in choosing the best discipline for gaining their life and health aims [Bu *et al*. 2010].

Presenting judo training as a proper model of pro-health behavior and the results of the examinations taken on the elite group of junior judo competitors as one of such models, seems to be justified.

It is obvious that the athletes gain better results of the physiology tests than people who are not involved in sports.

Many international researches are focused on respiratory and circulatory efficiency measured with the factor of maximum oxygen range ($V0_2max$), which to a great extent decides about the tolerance of the physical effort or about so called anaerobic effectiveness which allows for short but maximum

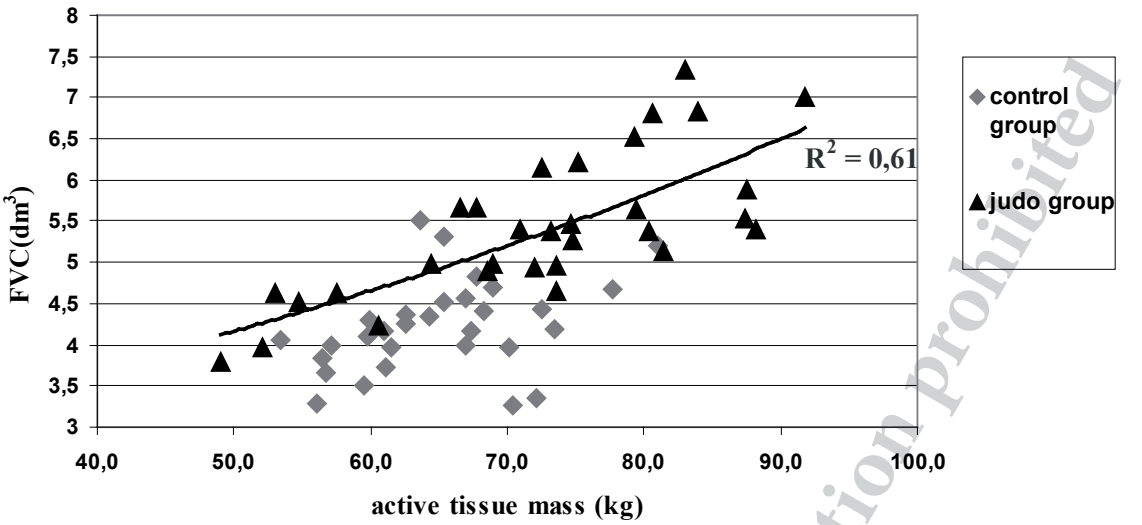

Fig. 3. The relationship of FVC (Forced Volume Vital Capacity) in the function of the mass of the active tissue in both examined groups.

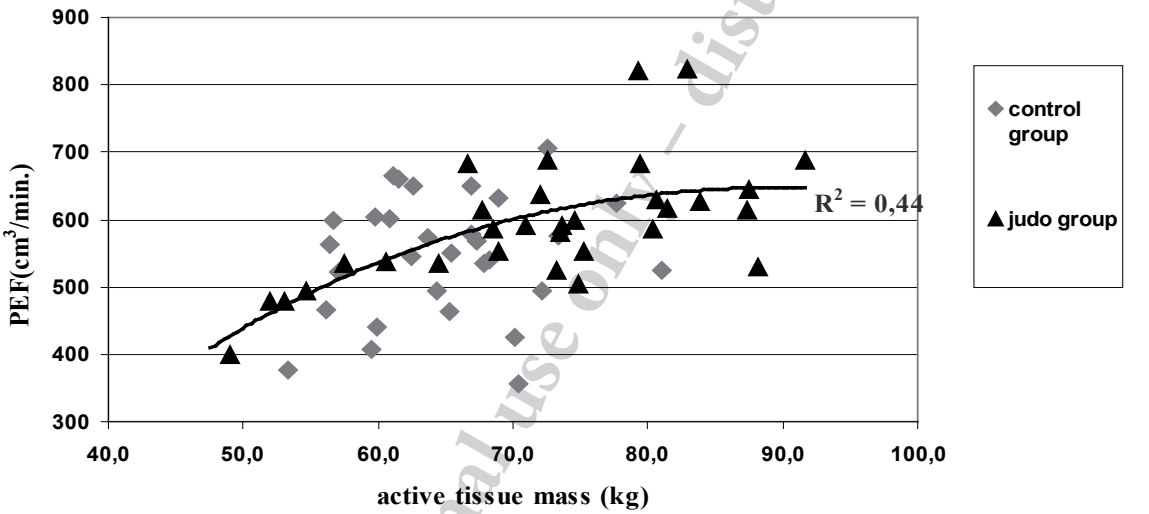

Fig. 4. The relationship of PEF (Peak Expiratory Flow) in the function of the mass of the active tissue in both examined groups.

efforts. However, the tests measuring those values are exhausting (e.g. Astrand-Ryhming, Wingate 30`) and are not in favor of young people who are not involved in sports in their lives [Barabasz *et al*. 2011].

A very interesting example of using judo as a non-standard pattern in the health prevention are the reports about so called 'judo therapy', which in Japan is perceived as a legal therapeutic method complementing the traditional medicine [Inoue, Karita, Yano 2005] and judo therapists work in the country health insurance program and the referral from the doctor is not needed [Nishikitani, Inoue, Yano 2008].

Thus, there are no obstacles for the spirometric tests to be used as one of the patterns as they are weak, easy to do and gain more and more popularity e.g. in academia [Przybylski *et al*. 2010; Bania *et al*. 2011].

One of the motivating factors to the further work on the respiratory system can be VC (Vital Capacity) which according to its genetic features can make individuals not involved in sports equal or even better in gaining results similar to famous athletes.

The comparison of the VC value and FVC, PEF, FEV1 parameters which are all depended on the training thus, worse for people who are not training can be a motivating factor to decrease the mentioned parameters by a light training [Przybylski *et al*. 2011].

The spirometric tests focusing on the handicapped both congenital and acquired as well

as blind and those with failing sight can demonstrate some unfavorable health tendencies despite the lack of direct physiological combination of the sight defect with the respiratory system.

It is obvious that people have a weaker ability of natural movements and that can generate other diseases.

The measurements of such a phenomenon are gained, among other things, by spirometry and they are of a great importance among young people [Przybylski *et al*. 2011].

There are also researches presenting the direct use of judo training in the therapy of the blind and those with the failing sight [Michalczak, Gryglewicz 1993].

The data presented in Table 1 demonstrates that the judo competitors are taller and heavier than individuals not involved in training (it is a result of a random choice of the judo competitors presenting various weight categories), but the BMI factor is similar in both examined groups (the statistic differences are of no importance here).

Comparison of age also indicates that the two treatment groups are similar somatic development (statistical differences do not matter here).

The data presented in Table 2 indicates the higher level of the fatty tissue, lower level of the active tissue and the weaker movable of the chest in the group of individuals not involved in training (the statistic differences are of no importance here).

The data grouped in Table 3 demonstrates that the results of the spirometric tests such as, FVC, FEV1and PEF are higher in the group of judo competitors (the statistic differences are of importance here, VC-no importance). Higher results indicate that there is a relation between the judo trainings and the increase of the basic spirometric values, and at the same time the effectiveness of the respiratory system of a young person, thus the result is statistically important.

There is also a connection between practicing judo and the decrease of the fatty tissue, increase of the active tissue and the improvement of the movable of the chest.

The additional information are contained in the analyses of the regression graphs presented in Fig. 1 to 4.

The data from the graph on Fig. 1 indicates that VC decreases with the growth of mass of active tissue. The presented relationships occurs in both examined groups and is statistically important - in the group of judo competitors it is on a high level **(R^2=0,55**), and in the group of individuals not involved in sports on a low level **(R^2=0,28).**

The graphs presented in Fig. 2 to 4 state that in the group of individuals not involved in sports there is the relationship between the level of active fatty tissue, and the changes of FVC, FVC1 and PEF.

In the group of judo competitors, all spirometric parameters show a statistically significant increase with the growth of the mass of active tissue (for FVC - **R^2=0,55**, for FEV1 - **R^2=0,61**, for PEF - **R^2=0,44**).

In comparison with the results for the group of individuals not involved in sports it may be assumed, that the respiratory system of the judo competitors, described by the above spirometric measures, is still at the development stage.

From the results of the examinations of the group of judo competitors and the group of individuals not involved in sports, the positive relationship between the judo training (from the early stage of life), the development of the respiratory system and the proper somatic development can be noticed. The examinations also show the tendency for the correct development in the group of judo competitors and the stagnation in the development in the group of individuals not involved in sports. Thus, the above conclusions seem to be fully justified.

Conclusions

1. Judo training, even at a young age, is meaningful for: the increase of active tissue, the decrease of the level of fatty tissue and the rise of the mobility of the chest, and it may be a stimulating impulse for the improvement of the figure and the proper 'respiratory route' [Śliwinska-Kowalska *et al*. 2002] among the individuals not involved judo so far.
2. The higher spirometric values in combination with the visible development of the respiratory system and the development of active tissue may create a good standard for improving the respiratory efficiency among individuals not involved in sports.
3. The additional motivating factor for individuals not involved in sports can be the combination of the development of the respiratory system with the values of self-defense of judo training.

References

1. Ali S.M., Lindström M. (2006), *Psychosocial work conditions, unemployment, and leisure-time physical activity: A population-based study,* "*Scand J Public Health*", no. 34 (2), pp. 209-216.
2. Artioli G.G., Iglesias R., Franchini, E., Gualano B., Kashiwagura D., Solis M., Benatti, F., Fuchs M., Lancha Junior A. (2010) *Rapid weight loss followed by recovery time does not affect judo-related performance,* "Journal of Sports Sciences", no. 28 (1), pp. 21-32.

3. Azevedo P.M.S.M., Drigo A.J., Carvalho M.CGA., Oliveira J.C., Nunes J.E.D., Baldissera V., Perez S. (2007), *Determination of judo enduranse preformance usin the uchi – komi technique and an adapted lactate minimum test,* "Journal of Sports Science and Medicine", no. 6 (CSSI-2), pp.10–14.
4. Bania A., Bania Ar., Kuźmińska A., Pujszo R., Dąbrowski S., Zdunkiewicz A. (2011), *Dobrostan fizyczny pracowników Uniwersytetu Kazimierza Wielkiego na podstawie pomiaru tkanki tłuszczowej i swobodnej pojemności życiowej płuc,* „Lider" [e-Journal].
5. Barabasz Z., Zadarko E., Shyyann O., Nakonechnyy Y., Pavlova I. (2011), *The analysis of cardio respiratory level of university students from Lviv in the background of population studies of Polish and Slovak students* (in Polish) [*Analiza poziomu wydolności krążeniowo oddechowej studentów uniwersytetów lwowskich na tle badań populacyjnych młodzieży akademickiej z Polski i Słowacji*], "Physical Activity Health and Sport", no. 4 (6), pp. 66-73.
6. Bronikowski M., Bronikowska M. (2011), *Will they stay fit and healthy? A three-year follow-up evaluation of a physical activity and health intervention in Polish youth,* "*Scand J Public Health*", no. 39 (7), pp. 704-713.
7. Bu B., Haijun H., Yong L, Chaohui Z., Xiaoyuan Y, Fiatarone Singh M.(2010), *Effects of martial arts on health status: A systematic review*, "Journal of Evidence-Based Medicine", no. 3 (4), pp. 205–219.
8. Calling S., Hedblad B., Engström G., Berglund G., Janzon L. (2006), *Effects of body fatness and physical activity on cardiovascular risk: Risk prediction using the bioelectrical impedance method,* "*Scand J Public Health*", no. 34 (6), pp. 568-575.
9. Inoue S., Karita K., Yano E. (2005), *Geographical Distribution of Judo Therapists and Orthopedists in Japan,* "Journal of Manipulative and Physiological Therapeutics", no. 28 (4), pp. 253-258.
10. Johansson G. (2010), *Overweight and obesity in Sweden. A five year follow-up, 2004-2008,* "*Scand J Public Health*", no. 38 (8), pp. 803-809.
11. Laskowski R., Smaruj M. (2008), *Changes in anaerobic capacity influenced by during three years of judo training of 14–16 year-old boys,* "Archives of Budo", no.4, pp. 22-25.
12. Levin S., Ainsworth B.E., Kwok CW., Addy CL., Popkin BM. (1999), *Patterns of physical activity among Russian youth: The Russian Longitudinal Monitoring Survey*, "Eur J Public of Health", no. 9 (3), pp. 166-173.
13. Michalczak W., Gryglewicz K. (1993), *Physical recreation for people with disabilities - judo for the blind and partially sighted*, [in Polish] *Rekreacja ruchowa dla osób niepełnosprawnych – judo dla niewidomych i niedowidzących*, „Zeszyty Naukowe AWF we Wrocławiu", no. 57, pp. 71-74.
14. Nishikitani M., Inoue S., Yano E. (2008), *Competition or complement: relationship between judo therapists and physicians for elderly patients with musculoskeletal disease,* "Environmental Health and Preventive Medicine", no. 13, pp. 123-129.
15. Perrot C., Mur J.I.M., Mainard D., Barrault D., Perrin P.H.P. (2000), *Influence of trauma induced by judo practice on postural control,* "Scandinavian Journal of Medicine & Science in Sports", no. 10 (5), pp. 292-297.
16. Przybylski G., Pujszo R., Pyskir M., Pyskir J., Bannach M. (2010), *Spirometry as one of wellness indicators female students of Kazimierz Wielki University in Bydgoszcz* [in:] *Environment and wellness in different phases of life*, ed. NeuroCentrum, Lublin, pp. 211-237.
17. Przybylski G., Pujszo R., Pyskir M., Pyskir J., Bannach M. (2011), *The wellness of blind and visually impaired young men on the basis of chosen spirometric parameters*, [in Polish] *Dobrostan fizyczny młodych mężczyzn niewidomych i niedowidzących na podstawie wybranych pomiarów spirometrycznych*, „Przegląd Medyczny Uniwersytetu Rzeszowskiego i Narodowego Instytutu Leków w Warszawie", Rzeszów, no. 2. pp. 315-324.
18. Przybylski G., Pyskir M., Pujszo R., Pyskir J., Bannach M. (2011), *Spirometric parameters of judo training and inactive young men - measured compared to predicted values as one of wellness indicators* [in:] *Wellnes in different phases of life*, ed. Medical University, Lublin, pp. 145-156.
19. Pyecha J. (1971), *Martial Arts in Physical Education. Judo: A Brief Historical Sketch* "Journal of Health, Physical Education and Recreation", no. 42 (3), pp. 26-31.
20. Rehrer N.J., Freeman C., Cassidy T., Waters D.L., Barclay G.E., Wilson N. (2011), *Through the eyes of young people: Favourite places for physical activity,* "*Scand J Public Health*", no. 39 (5), pp. 492-500.
21. Romé Å., Persson U., Ekdahl C., Gard G., (2010), *Willingness to pay for health improvements of physical activity on prescription,* "*Scand J Public Health*", no. 38 (2), pp. 151-159.
22. Salonen J.T., Tuomilehto J., Puska P. (1981), *The Relation of Physical Activity Changes to Changes in Serum Cholesterol and Body Weight in a Three-Year Follow-up of Population Sample,* "*Scand J Public Health*", no. 9 (3), pp. 109-117.
23. Sauka M., Priedite I.S., Artjuhova L., Larins V., Selga G., Dahlström O., Timpka T. (2011), *Physical fitness in northern European youth: Reference values from the Latvian Physical Health in Youth Study,* "*Scand J Public Health*", no. 39 (1), pp. 35-43.
24. Schnohr P., Grønbæk M., Petersen L., Hein H.O., Sørensen T.I. (2005), *Physical activity in leisure-time and risk of cancer: 14-year follow-up of 28,000 Danish men and women,* "*Scand J Public Health*", no. 33 (4), pp. 244-249.
25. Śliwinska-Kowalska M., Fiszer M., Kotyło P., Siatkowska E., Stępkowska M., Niebudek-Bogusz E. (2002), Effects of voice emission training on the improvement in voice organ funcyion among students attending the College for Teachers, "Medycyna Pracy", no. 3, pp. 229-232.
26. Tester G.I., Watkins G.G., Rouse I. (1999), *The Sports Challenge International Programme for Identified 'At Risk' Children and Adolescents: A Singapore Study,* "Asia Paciffic Journal of Public Health", no. 11 (1), pp. 34-38.

27. Tsioufis C., Kyvelou S., Tsiachris D., Tolis. P., Hararis G., Koufakis N., Psaltopoulou T., Panagiotakos D., Kokkinos P., Stefanadis C. (2011), *Relation between physical activity and blood pressure levels in young Greek adolescents: The Leontio Lyceum Study,* "Eur. J Public Health", no. 21 (1), pp. 63-68.
28. Van Tuyckom C. (2011), *Macro-environmental factors associated with leisure-time physical activity: A cross-national analysis of EU countries,* "*Scand J Public Health*", no. 39 (4), pp. 419-426.

Różnice w wybranych wartościach spirometrycznych u młodych judoków na tle grupy kontrolnej jako jeden ze wzorców do poprawy zdrowia młodego pokolenia

Słowa kluczowe : spirometria, judo, BMI, tkanka tłuszczowa, ruchomość klatki piersiowej

Streszczenie

Mała aktywność fizyczna młodego pokolenia przekłada się w latach następnych na problemy dużej części społeczeństwa, a więc również na zwiększenie wydatków budżetowych na ochronę zdrowia. Dlatego też oprócz tworzenia programów szkolnych i innych poprawiających kondycję fizyczną należy prezentować wzorce spośród różnych dyscyplin sportowych uprawianych przez młodych ludzi i wykazać ich pozytywne działanie prozdrowotne.

Wybrano i przebadano spirometrycznie czołowych juniorów - zawodników judo, oraz osoby nie trenujące w zbliżonym wieku o zbliżonych parametrach somatycznych.

Pomimo młodego wieku i nie zakończonego jeszcze w pełni rozwoju osobniczego młodych ludzi w obu badanych grupach, wyniki spirometryczne judoków były istotnie wyższe i wykazywały istotne zależności z niektórymi wielkościami somatycznymi. Zaprezentowanie wybranych różnic w spirometrycznym obrazie młodego człowieka trenującego judo i nietrenującego może być właściwym czynnikiem motywującym do aktywności fizycznej.