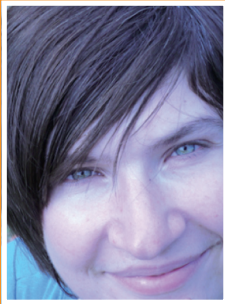


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Physical activity in therapy and prevention of old age illnesses

Summary: Physical activity as a means to maintain and improve one's health is currently becoming more and more appreciated among seniors. It is the most effective way of preventing lifestyle diseases such as ischaemic heart disease, hypertension, diabetes, and also, which is especially significant

for older people, prolongs life, prevents early death and severe illness consequences. Physical activity is recommended even for people over 80 years of age. There exists broad scientific proof of the major impact of physical exercise programs on shaping health and physical fitness in old age.

Key words: physical activity, preventive medicine, old age illness treatment.

The importance of physical exercise in preventing and treating senior age illnesses and general enfeeblement is currently growing because of the expanding group of older people in our society.

Physical activity is recommended up to very old age in a form which is appropriate for a person's age, general state and existing illnesses. Older people who generally suffer from more diseases may benefit most from physical activity, but implementing exercise routines for unfit people with a sedentary lifestyle also poses some risk.

In the @ktywny Senior project the research and teaching staff of the University School of Physical Education (AWF) in Wrocław shared their knowledge on physical activity in old age with the participants. A program of physical education was realized, which consisted of 6 hours of lectures and 24 hours of exercise. The aim was to present to the seniors the tasks and methods of physical activity in preventing and treating the most common old age illnesses as well as teaching them physical exercises and motivating seniors to supplement their basic physical activity.

The lectures included the following subjects:

1. The role of physical activity in old age.
2. The role of physical activity in the treatment of cardiovascular illnesses, which are typical of old age.
3. The role of physical activity in preventing and treating respiratory system illnesses.
4. Physical activity in locomotive organs diseases typical for old age.
5. Cognitive and emotional dysfunctions in old age.
6. The role of physical activity in treating cancer.

The workshops proposed for the seniors included:

- elements of psychotherapy,
- general gymnastics,
- terrain therapy,
- practical learning of Nordic Walking,
- balance and fall prevention training.

The assumed effects of the training were for the participants to acquire knowledge and skills concerning the aims and tasks of physical activity, its relation to preventing selected old age illnesses, the functions of control and self-control of the body's reaction to physical activity, the structure of a training unit and forms of organizing physical exercise training.

The expected result was to increase mobility as well as physical and social activity of the participants.

Do seniors appreciate physical activity?

Physical activity is a significant element of successful aging. Unfortunately, a considerable decrease of physical activity is observed in older people, which means restricting it to everyday chores such as shopping, cooking, helping children and grandchildren.

However, retaining high physical activity in old age is one of the factors which correlate with a longer life expectancy and allows seniors to keep their autonomy and independence, therefore improving their quality of life¹⁾.

Physical involution in old age includes a variety of regressive changes, which lead to losing energy efficiency of the organism, reducing its fitness and immunity, which means more frequent health problems. Fitness of the organism decreases significantly because of worse coordination between cooperative processes²⁾. A decrease of physical strength and energy of the organism takes place, which promotes a passive lifestyle. A person in such a situation has to show a great will of being active and be aware of the benefits of regular physical activity. It is an important challenge³⁾. Was it taken up by the "active seniors"?

Surveys conducted in the course of the project (in the form of anonymous questionnaires) reveal the following image of seniors taking part in the project: the youngest participant is 60, the oldest is 83 (with the average age being 67). The beneficiaries are people with higher (52.72%) or secondary (32.72%) education, each of them had been retired or had been receiving disablement benefits for 1 to 45 years. Most of the participants were women (70.90%). The most commonly mentioned reason for participating in the project was the desire to be able to use the computer and internet. The second stated reason was to broaden knowledge and increase physical activity. Recreational physical activity was declared by 45.44% of participants. 56.35% of participants appreciate physical activity in their daily lives, 38.20% do not have any opinion on this topic and 5.45 do not believe that physical activity helps them in their daily lives. The most commonly declared health problems were hypertension (49.09%), osteoarthritis (10.90%), type 2 diabetes (5.45%) and osteoporosis (5.45%). The physical education training sessions were described as satisfactory by 58.18% of beneficiaries, 10.87% described them as unsatisfactory, 4.54% as moderately satisfactory with 25.45% not stating any opinion.

Workshops offered to seniors in the Universities of the Third Age span almost every possible field of knowledge – foreign languages, technology, humanities, etc. They also include physical activity (rehabilitation, field trips, etc.)

Benefits of regular physical activity are manifested not only physiologically, but also psychologically, sociologically, and culturally.

¹⁾ M. Kaczmarczyk, E. Trafiałek, *Aktywizacja osób w starszym wieku jako szansa na pomyślne starzenie*, „Gerontologia Polska” 2007/15/4, pp. 116–118.

²⁾ N. Wolański, *Rozwój biologiczny człowieka. Podstawy auksologii, gerontologii i promocji zdrowia*, Warszawa 2006.

³⁾ H. Zielińska-Więczkowska, K. Kędziora-Kornatowska, T. Kornatowski, *Starość jako wyzwanie*, „Gerontologia Polska” 2008/16/3, pp. 131–136.

The existing state of knowledge about the role of physical activity in old age

Low physical activity in old age is the result of actual old age physiological changes, a lifestyle leading to hypodynamia as well as coexisting pathological changes. The decrease in oxygen efficiency, strength, power and elasticity of muscles as well as increased illness incidence lead to increasing dependence on other people. Physical activity may effectively minimize or eliminate the undesirable effects of illnesses and physical inability of old people, giving them the chance to increase physical efficiency, re-socialise and reintegrate.

Lengthening the period of physical fitness and independence, and so improving quality of life is the main positive effect of physical activity⁴⁾. A minimal oxygen efficiency of approximately 13–14 ml/kg/min of maximum oxygen consumption (VO₂ max) is required for independent functioning. Physical training increases physical fitness and delays the fall in VO₂ max for about 10–20 years for physically active people when compared to those with a sedentary lifestyle. Even a slight increase in VO₂ max (3–4 ml/kg/min) can prolong the period of physical fitness and independence by 6–7 years⁵⁾.

The effect of regular physical activity on the circulatory system is the one documented best. Physical activity modifies the risk factors of ischemic heart disease: hypertension, fat management disturbance, overweight and obesity, sedentary lifestyle and low physical activity, smoking, inaccurate glucose tolerance and diabetes, incorrect diet, personality and behaviour types.

Physical activity has its significant role in healthy diet and nutrition state of old people⁶⁾, prevents excessive fat tissue aggregation, and slows down the loss of fat-free body mass with age. It probably also has a positive effect on certain hormones (growth hormone -GH, insulin-like growth factor 1 -IGF1), whose level in blood decreases with age⁷⁾. The positive effect of regular physical activity on muscle mass and strength, also in handicapped people in very advanced age⁸⁾, is well documented. Basic metabolism decreases with age, usually without a proportional reduction in basic nutritional elements intake. A higher energy requirement in physically active

⁴⁾ T. Kostka, M. Bonnefoy, J-R. Lacour, W. Drygas, *Metody oceny aktywności ruchowej u osób w podeszłym wieku*, „Polski Merkuriusz Lekarski” 1997/3/18, p. 299; M. Berger, *The role of physical activity in the life quality of older adults*, “Physical activity and aging”, 1988, 42; S.F. Shephard, *Physical fitness: exercise and ageing*, „Principle and practice of geriatric medicine” 1991.

⁵⁾ T. Kostka, M. Bonnefoy, J-R. Lacour, W. Drygas, op.cit.; S.F. Shephard, op.cit.

⁶⁾ T. Kostka, M. Bonnefoy, J-R. Lacour, W. Drygas, op.cit.; S.F. Shephard, op.cit.

⁷⁾ T. Kostka, M. Bonnefoy, J-R. Lacour, W. Drygas, op.cit.; S.E. Borst, W.J. Millard, D.T. Lowenthal, *Growth hormone, exercise, and aging: the future of therapy for the frail elderly*, “Journal of the American Geriatrics Society” 1994/42, p. 528.

⁸⁾ T. Kostka, M. Bonnefoy, J-R. Lacour, W. Drygas, op.cit.; M. Fiatarone, E.F. O’Neill, N.D. Ryan, K.M. Klements, G.R. Solares, M.E. Nelson, S.B. Roberts, J.B. Kehayias, L.A. Lipsitz, W.J. Evans, *Exercise training and nutritional supplementation for physical frailty in very elderly people*, “The New England Journal of Medicine” 1994/330, p. 1769.

people ensures a quantitatively and qualitatively better fulfilment of basic nutritional elements requirements.

The data from a growing amount of experimental and clinical research points to the positive effect of regular physical activity on the immunity system. The positive effect of physical activity on the psyche and quality of life is also significant⁹⁾. The positive effects of regular physical activity on health, i.e. a statistical longer life expectancy has also been proved both qualitatively and quantitatively¹⁰⁾.

Advice for seniors

Advice concerning physical activity for older people is given individually. It depends on their age, coexisting illnesses, general state and the degree of physical fitness. Regular physical activity of seniors should contain elements of stamina (endurance) training, resistance exercise and stretching, which ensures the effect on oxygen efficiency, muscle strength as well as agility, balance and coordination.

Endurance exercise, i.e. march, running, swimming, biking should be done twice a week for at least 20 minutes. Exercise intensity should ensure that it is done on a 40–60% heart rate reserve level (the difference between maximum heart rate during a cardiac stress test and while resting). Dynamic resistance exercise should be done twice a week for at least 20 minutes and include 1 set of exercises covering 8–10 exercises engaging the most important muscle groups. The weight intensity should be selected in such a way that each exercise can be done 10–15 times (10–15 repetitions of a given move). Stretching exercise (gymnastics, stretching) is best performed everyday for 5–10 minutes¹¹⁾.

Conclusion

As it was mentioned earlier, the interest of people over 60 years of age in the *@ktywny Senior* programme was the result of a desire to learn to use the computer, and also (to a lesser extent) broadening knowledge and improving physical activity. One of the preferred forms of work was taking part in fitness gymnastics trainings lead by physical culture and physiotherapy specialists.

Preventing social marginalization of the older generation and promoting a healthy lifestyle is a major challenge for Polish gerontology and social institutions. It is of top priority for maintaining health and independence to an advanced age.

⁹⁾ T. Kostka, M. Bonnefoy, J-R. Lacour, W. Drygas, op.cit.; M. Berger, op.cit.

¹⁰⁾ R.S. Paffenbarger, R.T. Hyde, A.L. Wing, I.M. Lee, D.L. Jung, J.B. Kampert, *The association of changes in physical-activity level and other lifestyle characteristics with mortality among men*, "The New England Journal of Medicine" 1993/328, p. 538.

¹¹⁾ B. Wizner, *Prewencja gerontologiczna*, [w:] T. Grodzicki, J. Kocemba, A. Skalska, *Geriatry z elementami gerontologii ogólnej*, Gdańsk 2006, pp. 53–59.

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