

HEALTH AND PHYSICAL ACTIVITY

Tiziana D'Isanto¹, Antonetta Manna¹ and Gaetano Altavilla²

¹MIUR Campania, Italy

²University of Basilicata, Potenza, Italy

Original scientific paper

Abstract

The increasing levels of physical inactivity and availability of food high in calories are bringing an increasing number of people developing pathological conditions such as obesity, type 2 diabetes, osteoporosis, cardiovascular disease, respiratory disease, colon cancer and breast cancer. In this review, it became evident that the lack of physical activity can contribute negatively to various diseases, and, what are the possible strategies recommended to promote changes in lifestyle to maintain acceptable levels of physical activity and to ensure a durable psychological and physical well-being. A key challenge for all those working in the health and physical-sportive and undoubtedly capable to identify strategies that facilitate physical activity participation in adequate amounts, in relation to the possibilities and age, in order to produce benefits for all, in terms of learning, participation and inclusion.

Keywords: physical activity, sedentary, wellbeing, lifestyle, pathologies and risk prevention.

Introduction

Today is consolidated the importance of physical activity to health, so it is important to know the effects of exercise for primary prevention, secondary and for the treatment of widespread diseases in industrialized countries. It is equally important to disseminate information on the sedentary lifestyle, which causes dangerous risks, reducing life expectancy and negatively influencing the health expense. The data collected from recent studies show that the population inactivity can be a risk, since it can adversely affect both the mental and physical health, which on the economy and society (Altavilla, 2016). In opposite way the qualitative/quantitative aspects of performance have to deepened (Raiola, 2015c, Raiola, Tafuri, 2015 abc). Also in the period age between 3 - 11 years old the physical activity in the school has a primary role for the wellness and healthy status (Raiola 2011ab). The physical activities are the foundation of all learning and accompanying personal development at every stage (Altavilla et al, 2015a), meanwhile in the last decade has seen massive entrance of pervasive computing among sport-related technologies (Di Tore P.A., 2015). With passing of the years and with the progress, people have devoted always less space physical exercise, preferring a sedentary life; in young people this way of life is associated with a diet high in calories and fats that contributes to the increase in body weight and of fat mass until to determine the problem of overweight and obesity. In Italy 30% of adults between 18 and 69 years plays, in everyday life, less physical activity than is recommended and can be defined sedentary. In particular, the risk of sedentary, increases with the age, and is higher among people with low educational attainment and economic difficulties. The role of the school and the sports and its interaction is particularly important both educational and training processes (Gaetano, Rago, 2014, Gaetano, 2012ab, Gaetano et al, 2016,

Gaetano et al, 2015). The lack of physical activity can contribute negatively to various diseases, such as type 2 diabetes, osteoporosis, obesity, cardiovascular disease, respiratory disease, colon cancer and breast cancer.

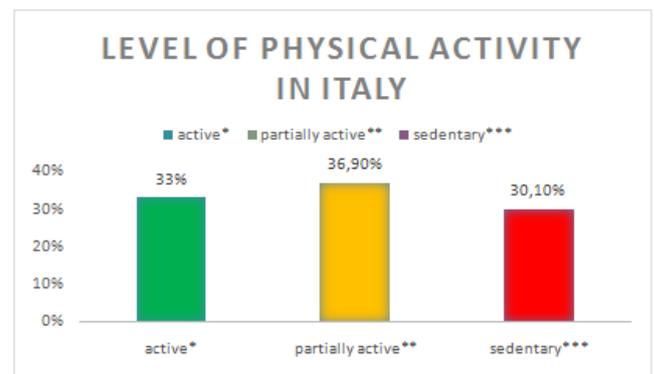


Figure 1. PASSI Report 2011 epicentro.iss.it

The World Health Organization has declared obesity as a "worldwide epidemic" since the pattern has been repeated in developing countries combined with the increase in more developed nations (WHO, June 1997). Childhood obesity has been called "one of the most serious public health challenges of the 21st century", (WHO, 2012). Obesity can harm nearly every system in a child's body—heart and lungs, muscles and bones, kidneys and digestive tract, as well as the hormones that control blood sugar and puberty and can also take a heavy social and emotional toll (Ebbeling et al., 2002). Recent surveys show that in Italy, in 2010, the percentage of sedentary was dropped below 39%, over the previous year, and in 2009 there was an increase in physical activity by 3% in the age group 6 to 10 years. This will allow at new generations to safeguard the health, through continuous practice of physical activity, as it will foster the calorie

balance, will help to reduce overweight, will increase the efficiency of the cardiovascular system and a feeling of psychological well-being. The development of each person is realized by the physical activity, social, cognitive and emotional, they operate in such a way as to be interconnected and interdependent, so much so that any change occurs in any of these areas affects and is affected by other them (Altavilla et al, 2014ab). Physical inactivity or the sedentary may foresee some muscle activity and consequent changes in metabolic functions and other functions. The physical inactivity is, therefore, the lack of muscle contractions sufficient to stimulate the reconstruction, the lack of a sufficient increase in the metabolism and the lack of a sufficient amount of movements of certain intensity, such as to require skills which allow maintaining the motoric control. In the sportive training this level of stimuli is defined physiological overload (Cirillo et al., 2016). Regular physical activity has a number of benefits, which are amplified if it is started in very young age, in overall terms and in terms of physical well-being (Altavilla, Di Tore, 2016, Altavilla, Raiola, 2014, 2015).

Studies have provided evidence that various diseases are present mainly in people who do not normally perform a physical activity, compared to those that habitually practice a constant physical activity. The frequency of these pathological conditions in inactive subjects has steadily increased in recent decades (Booth et al, 2002). In it was found a clear relationship between the lack of physical activity and increased incidence of disease states, however, not due to factors such as age, gender, body fat, smoking, alcohol, the previous state health, education, income, etc. were provided increasingly clear evidence that physical inactivity is a cause of serious problems for individual health.

Physical activity remains the biological stimulus needed for the preservation of structures, of functions of the organs and systems, so that they can perform at the best their physiological tasks. And if health is conceived as energy for survival, for the physical performance, for cognitive and social life, then the adaptations due from the moderate activity, both in quantity for intensity, they improve health, reducing the risk of certain diseases, such as the type 2 diabetes, the overweight and obesity. The role of physical inactivity as a risk factor varies greatly from person to person and between the different pathologies, even if it remains a high risk factor for the start of the sarcopenia (loss of muscle mass) and osteoporosis in people elderly (bones brittle), while result a weaker risk factor for coronary heart disease and cancer.

Aim and methods

The aim is to investigate the phenomenon and establish some significant aspects and deliver relationships between physical inactivity and the state of individual health.

The method is the theoretical approach is founded for this study where the documentary research type and the argumentative one are joined according to social, psycho-pedagogical paradigm of physical activity and sports.

Discussion

At age 50, many people have already lost 10% of their muscle mass, while at 70 years it will have lost about 70%; as well as the loss of muscle strength is on the same proportions. This (sarcopenia) can be seen especially in physically inactive individuals, but also in those subjects who continued to be physically active (Roth et al., 2000). The loss of muscle mass leads to serious consequences (Vandervoort and Symons 2001), in fact produces a deterioration in physical function (difficulty rising from a chair, climbing stairs, to make a brisk walking without losing balance). The precarious balance and the scarce muscle strength are important factors that can greatly increase the risk of falls. The probability of a functional decay, in older people who have a loss of muscle mass (moderate to severe), is two-three times higher than in people without this condition (Janssen et al., 2002). Lack of a sufficient muscular force which causes tensile stresses and torsion on the bones accelerates the loss of bone tissue, increasing the risk of osteoporosis. The loss of bone tissue increases bone fragility and the risk of fractures, so you need to do prevention, own because it causes disability, pains, high treatment costs and mortality. Physical inactivity affects the risk of osteoporotic fractures, as it increases both the risk of osteoporosis that of falls (Rubenstein. 2006).

Table 1. Cause of falls in elderly adults: summary of 12 studies that carefully evaluated elderly persons after a fall and specified a most likely cause (Rubenstein, 2006).

Cause	Mean percentage (%)	Range (%)
Accident/ environment-related	31	1-53
Gait/balance disorders or weakness	17	4-39
Dizziness/vertigo	13	0-30
Drop attack	9	0-52
Confusion	5	0-14
Postural hypotension	3	0-24
Visual disorder	2	0-5
Syncope	0,3	0-3
Other specified causes	15	2-39
Unknown	5	0-21

Physical inactivity increases the risk of fractures from osteoporosis - it increases the risk of falls. The risk of falls is greater due to poor muscle strength, poor joint mobility, unsteady gait and poor balance; these factors are negatively affected by physical inactivity and positively by physical activity (Tinetti, 2003). Prevalence of osteoporosis, ISTAT survey on health 1999-2000. For 100 persons of the same age and sex

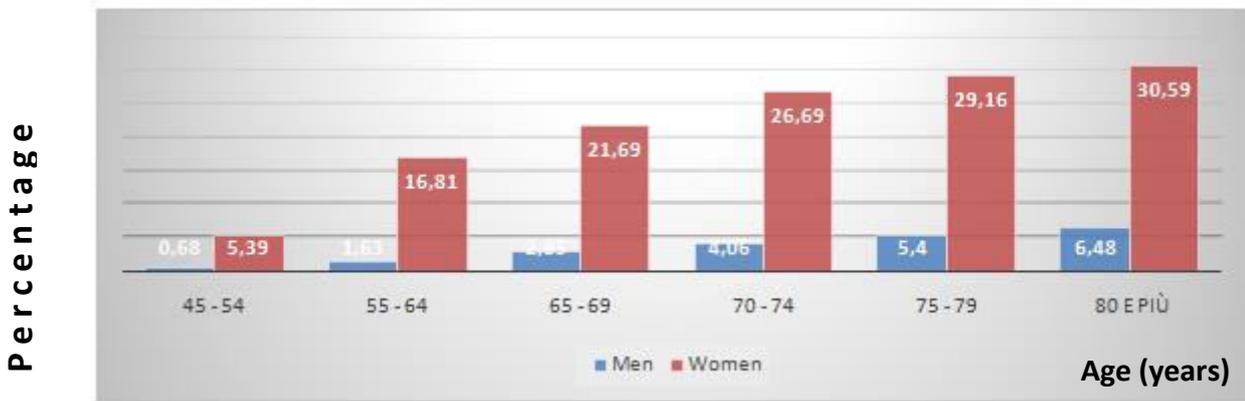


Figure 2. Farchi G. – Higher Health Institute, 2001 - epicentro.iss.it

The physical activity effects growth and on bones is well known, in fact, temporary immobilization, for example, after a serious injury, makes hypotonic and untrained. Physical activity habitual and lengthy (also in adulthood) could provide a kind of insurance against cardiovascular disease (Altavilla et al., 2015b). The 70-85% of the Italian population experiences pain, muscle tension and the stiffness in the lower back. In school-age children has been detected an increase of back pain (Hakala et al., 2006), and it is unclear what the role of muscle strength and lack of regular physical activity, symptoms are positively correlated with the duration of the sitting position at school (Geldhof et al., 2007). The most common cause of overweight and obesity is the excess of energy intake, compared to its consumption. The risk of incur health problems increases only slightly in case of low or moderate overweight, but becomes significantly high in the case of obesity.

With regard to obesity, the physical inactivity has important consequences on the health not only because it increases the risk of this condition, but also for the alterations on the metabolism. This is confirmed by several studies, that the risk of death from coronary artery disease and diabetes, for example, is greater in obese and physically inactive compared with obese subjects with a good physical condition (Stevens et al., 2002).

Diabetes type 2 (adult diabetes or non-insulin dependent) is a disease in continuous rising in many populations, is due, in addition to the genetic predisposition, also at environmental factors such as obesity, a sedentary lifestyle and a diet rich in saturated fats. Several studies have provided evidence that physical inactivity increases of 20-70% risk of developing type 2 diabetes (Solomon et al., 2001; Hu et al., 2003). The coronary artery disease or ischemic heart disease is characterized by the gradual clogging of the arteries and causes a gradual deterioration of the heart's pumping function. Coronary heart disease in the world, causes every year about 7.5 million deaths and more than 10 million heart attacks. The high incidence in many countries can be attributed primarily to three factors: an unhealthy diet, lack of physical activity and at smoking (Grundy, 1999).

In sedentary individuals, compared to those who perform moderate exercise, the risk of coronary heart disease rose from 30 to 50%. The tumor is produced mainly from exposure to carcinogens contained in what a person eats, drinks or she breathes. It is estimated that the number of new cases in a year will increase from 10 million to 15 million in 2020 (WHO 2002).

There is evidence significant that physical inactivity is associated at a risk of the 30-40% increased of colon tumors, as well as in women, the physical inactivity leads to an increase of 20-30% in the risk of breast cancer (Rintala et al., 2003). A limited or a lack of regular physical activity would lead to greater mortality from cancer (Tanaka et al., 2003). Several scientific studies have established that physical inactivity increases the risk of mortality, of which the largest component is represented by cardiovascular diseases (Lee & Skerret, 2001).

Recommendations and suggestions

Scientific societies such as the American College of Sports Medicine and the Center for the Control and Prevention of the US disease (Centres for Disease Control and Prevention), have provided recommendations on how much exercise you should do to maintain the health status and reduce risk factors for a large number of diseases (Battistini et al., 2007). The persons physically inactive have a risk from 20% to 30% greater of mortality than those who follow the guidelines on the minimum necessary of physical activity from carry out (at least 30 minutes of physical activity at a moderate intensity for the highest number of days per week). Moving every day has positive effects on physical and mental health of the person.

WHO recommends as a basic activity of the aerobic exercises, that is, those protracted and not excessive intensity, like brisk walking, running or pedaling. These should be integrated, 2-3 times a week, with power exercises, that is limited in time but more energetic, to train muscle strength and strengthen your bones: it is not necessary utilize complicated equipment, in fact it is possible to stimulate the strength even at natural load, when it is the same weight of the body to act as a tool.

Table 2. Several scientific studies confirm the beneficial effects and highlight that physical activity has

Risk factors	Beneficial effects
- Type 2 diabetes	- Improves glucose tolerance and reduces the risk to become ill of type 2 diabetes
- Hypercholesterolemia and hypertension	- Reduces the levels of blood pressure and of the cholesterol
- Heart disease and cancers	- Decreases the risk of developing heart disease and cancers, such as colon and breast
- Myocardial infarction	- Reduces the risk of premature death, in particular that caused by myocardial
- Osteoporosis and fractures	- Prevents and reduces the risk of osteoporosis and fractures
- Stress and depression	- Reduces the symptoms of anxiety, stress and depression
- Risk behaviors	- Prevents, especially among children and young people, risk behaviors such as use of tobacco, alcohol, unhealthy diets, violent attitudes and promotes psychological well-being by developing self-esteem, and facilitates the management of anxiety and stressful situations
- Obesity	- Produces energy expenditure and decreases the risk of obesity

Conclusion

There is a strong need to increase the levels of participation of all at the physical activities, sportive and amateur throughout life, in order to ensure a better quality of life for all, proposing health policies, school and sportive capable of involving the greatest number of people, to support even those who do not have the financial ability and to create new infrastructure in the less developed areas of Italy.

The lifestyles of modern society and the importance of movement makes it essential, that in the context in which they live and develop, create opportunities for physical activity, increasing, for example, urban areas for games, creating safe bicycle paths and walking, using interior spaces of the palaces and opening the school gyms in the afternoon.

The human being is born to get around: the movement is connate in him and a regular physical activity, even moderate, it helps to improve the quality of life. On the contrary, the lack of physical activity causes the onset of some of the disorders and diseases more common today: type 2 diabetes, cardiovascular disease (heart attack, myocardial infarction, stroke, heart failure) and certain cancers.

References

- Altavilla, G., & Raiola, G. (2015). Sports game tactic in basketball, *Sport Science*, 8(1), 43-46.
- Altavilla, G., & Raiola, G. (2014). Global vision to understand the game situations in modern basketball, *Journal of Physical Education and Sport*, 14(4), 493-496.
- Altavilla G., Tafuri D., & Raiola G. (2014a). Some aspects on teaching and learning by physical activity, *Sport Science*, 7(S1), 7-9.
- Altavilla, G., Tafuri, D., & Raiola, G. (2014b). Influence of sports on the control of static balance in physical education at school, *Journal of Physical Education and Sport*, 14(3), 351-354.
- Altavilla G., Furino F., Di Palma M., & Raiola, G. (2015a). Physical skills, sport learning and socio-affective education, *Sport Science*, 8(S1), 44-46.
- Altavilla G., Furino F., Di Palma M., & Raiola G. (2015b). The child hypokinetic and the overtrained, *Sport Science*, 8(S1), 72-74.
- Altavilla G., (2016) Relationship between physical inactivity and effects on individual health status, *Journal of Physical Education and Sport*, 16(S2).
- Altavilla G., & Di Tore P.A. (2016). Physical education during the first school cycle: a brief social psychopedagogical summary, *Journal of Physical Education*, 16(2).
- Battistini D., Piana N., & De Feo P. (2007). Strategie cognitive-comportamentali per incoraggiare l'uso dell'attività fisica nello stile di vita delle persone con diabete. [Cognitive-behavioral strategies to encourage the use of physical activity in the lifestyle of people with diabetes. In Italian.]. *G It Diabetol Metab*, 27(3), 129-137.
- Booth, F.W., Chakravarthy, M.V., & Spangenburg, E.E. (2002). Exercise and gene expression: physiological regulation of the human genome through physical activity, *The Journal of Physiology*, 543(2), 399-411.
- Cirillo G., Nughes E., Acanfora A., Altavilla G., & D'Isanto T. (2016). Physical and sport education testing by quantitative and qualitative tools in assessment in senior school: a proposal, *Sport Science*, 9(S1).
- Di Tore, P.A. (2015). Situation awareness and complexity: The role of wearable technologies in sports science, *Journal of Human Sport and Exercise*, 10(S1), 500-506.
- Ebbeling, C.B., Pawlak, D.B., & Ludwig, D.S. (2002). Childhood obesity: public-health crisis, common sense cure. *The Lancet*, 360(9331), 473-482.
- Gaetano, R., Gaetano, A., Domenico, T., & Mario, L. (2016). Analysis of learning a basketball shot, *Journal of Physical Education and Sport*, 16(1), 3-7.
- Gaetano, R., & Rago, V. (2014). Preliminary study on effects of hiit-high intensity intermittent training in youth soccer players, *Journal of Physical Education and Sport*, 14(2), 148-150.
- Gaetano, R. (2012a). Motor learning and didactics into physical education and sport documents in middle school-first cycle of education in Italy, *Journal of Physical Education and Sport*, 12(2), 157-163.

- Gaetano, R. (2012b). Didactics of volleyball into the educate program for coaches/trainers/technicians of Italian Federation of Volleyball (FIPAV), *Journal of Physical Education and Sport*, 12(1), 25-29.
- Geldhof E., Cardon G., De Bourdeaudhuij, I., Danneels, L., Coorevits, P., & Vanderstraeten, G. (2007). Effects of back posture education on elementary schoolchildren's back function, *European Spine Journal*, 16(6), 829-839.
- Grundy S.M., Benjamin I.J., Burke G.L., Chait A., Eckel R.H., Howard B.V., Mitch W., Smith S.C., & Sowers J.R. (1999). Diabetes and Cardiovascular Disease, A Statement for Healthcare Professionals From the American Heart Association, *Circulation*, 100(10), 1134-1146.
- Guetano, R., Lipoma, M., & Tafuri, D. (2015) Postural control in young soccer players: Differences between the cognitive approach and ecological-dynamic one, *J of Human Sport and Exercise*, 10(S1), 385-390
- Hakala P.T., Rimpela A.H., Saarni L.A., & Salminen J.J. (2006). Frequent computer-related activities increase the risk of neck-shoulder and low back pain in adolescents, *European J of Public Health*, 16(5), 536-541.
- Hu, F.B., Li. T.Y., Colditz, G.A., Willett, W.C., & Manson, J.E. (2003). Television Watching and Other Sedentary Behaviors in Relation to Risk of Obesity and Type 2 Diabetes Mellitus in Women, *Journal of the American Medical Association*, 289(14), 1785-1791.
- Janssen, I., Heymsfield, S.B, & Ross, R. (2002). Low relative skeletal muscle mass in older persons is associated with functional impairment and physical disability, *J of the American Ger Soc*, 50(5), 889-896.
- Lee, I.M., & Skerrett, P.J. (2001). Physical activity and all-cause mortality: what is the dose-response relation? *Medicine & Science in Sports & Exercise*, 33(S6), 459-471;
- Pizzuto, F., Rago, V., Bailey, R., Tafuri, D., & Raiola, G. (2016) The importance of foot strike patterns in running: A literature review, *Sport Science*, 1(S1), 87-96.
- Rago, V., Leo, I., Pizzuto, F., Costa, J., Angeicchio, G., Tafuri, D., & Raiola, G. (2016) Variation of oxidative stress of elite football players during pre-season and in season, *Journal of Physical Education and Sport*, 16(2), 326-329.
- Raiola, G. (2015a). Sport skills and mental health. *J. Hum. Sport Exerc.*, 9(Proc1).
- Raiola, G. (2015b). Inclusion in sport dance and self perception, *Sport Science*, 8, 99-102.
- Raiola, G. (2015c). Basketball feint and non-verbal communication: Empirical framework, *Journal of Human Sport and Exercise*, 10(S1), 360-368.
- Raiola, G., & Tafuri, D. (2015a). Pilot work on training for quantitative aspects of performance, *Sport Science*, 8(2), 90-93.
- Raiola, G., & Tafuri, D. (2015b). Assessment and periodization in amateur soccer team, *Spo Sci*, 8, 26-29.
- Raiola, G., & Tafuri, D. (2015c). Teaching method of physical education and sports by prescriptive or heuristic learning, *Journal of Human Sport and Exercise*, 10(S1), 377-384.
- Raiola, G. (2014). Teaching method in young female team of volleyball, *Journal of Physical Education and Sport*, 14(1), 74-78.
- Raiola, G. (2011a). A study on Italian primary school rules: Neurophysiological and didactics aspects in physical education and sport, *Journal of Physical Education and Sport*, 11(2), 43-48.
- Raiola, G. (2011b). Study between neurophysiological aspects and regulation documents on preschool in Italy, *Journal of Physical Education and Sport*, 11(1), 42-47.
- *** Rapporto Nazionale Passi, 2011, Attività fisica - Istituto Superiore Sanità, epicentro.iss.it
- Rintala, P., Pukkala, E., Läärä, E., & Vihko, V. (2003). Physical activity and breast cancer risk among female physical education and language teachers: A 34-year follow-up, *Int J of Cancer*, 107(2), 268-270.
- Roth, S.M., Ferrell, R.F., & Hurley, B.F. (2000). Strength training for the prevention and treatment of sarcopenia, *Journal of nutrition, health & aging*, 4(3), 143-155.
- Rubenstein, L.Z. (2006). Falls in older people: epidemiology, risk factors and strategies for prevention, *British Society for Research on Ageing*, 35(S2), 37-41.
- Sherrill C., & Hutzler Y. (2010). *Adapted physical activity sciences. Directory of sport science*. Berlin: ICSSPE/CIEPSS.
- Solomon, C.G., Hu, F.B., Manson, J.E., Stampfer, M.J., Colditz, G., Liu, S., & Willett, W.C. (2001). Diet, Lifestyle, and the Risk of Type 2 Diabetes Mellitus in Women, *The New Eng J of Med*, 345(11), 790-797.
- Stevens, J., Cai, J., Evenson, K.R., Thomas, R. (2002). Fitness and fatness as predictors of mortality from all causes and from cardiovascular disease in men and women in the lipid research clinics study, *American Journal of epidemiology*, 156(9), 832-841.
- Tanaka, H., Sawada, S.S., Muto, T., Lee, I.M., Paffenbarger, R.S.Jr., Shindo, M., & Blair, S.N. (2003). Cardiorespiratory fitness and cancer mortality in Japanese men: a prospective study, *Medicine and Science Sports Exercise*, 35(9), 1546-1550.
- Tinetti, M.D. (2003). Preventing falls in elderly persons, *The New England Journal of Medicine*, 348, 42-49.
- Vandervoot, A.A., & Symons, T.B. (2001). Functional and metabolic consequences of sarcopenia. *Canadian journal of applied physiology*, 26(1), 90-101.
- *** Farchi G. (2001). Studio pilota condotto in Italia epicentro.iss.it, Istituto Superiore Sanità. [Pilot study conducted in Italy - epicentro.iss.it, Superior Health Institute. In Italian.]
- *** WHO (World Health Organization) 2002, 2010, Global recommendations on physical activity for health
- *** World Health Organization. (1997). Obesity: Preventing and Managing a Global Epidemic.
- *** World Health Organization. (2012). Prioritizing areas for action in the field of population- based prevention of Childhood Obesity.
- *** Medicine & Science in Sports& Exercise, Boston, MA

ZDRAVLJE I TJELESNA AKTIVNOST

Sažetak

Povećanje razine tjelesne neaktivnosti i raspolaganje visokokaloričnom hranom donose veći broj patoloških stanja kod ljudi, kao što su pretilost, dijabetes tipa 2, osteoporoza, kardiovaskularne bolesti, bolesti dišnog sustava, debelog crijeva i raka dojke. U ovom pregledu postalo je jasno da nedostatak tjelesne aktivnosti može pridonijeti negativno na razne bolesti. Preporuča se promicanje promjene u načinu života za održavanje prihvatljive razine tjelesne aktivnosti. Ključni izazov za sve one koji rade u području zdravlja i sporta je bez sumnje biti sposoban identificirati strategije koje olakšavaju sudjelovanje u tjelesnim aktivnostima u odgovarajućim količinama, u odnosu na mogućnosti i dobi, kako bi postojala korist za sve, u smislu učenja, sudjelovanja i uključivanja.

Ključne riječi: *tjelesna aktivnost, sjedilački, dobrobit, način života, patologija, prevencija rizika.*

Received: November 19, 2016

Accepted: February 18, 2017

Correspondence to:

Tiziana D'Isanto

MIUR Campania, Italy

E-mail: tizidisanto@libero.it