

THE IMPORTANCE OF PHYSICAL ACTIVITY IN THE PROCESS OF SUCCESSFUL AGEING — AN OVERVIEW

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Abstract Rising life expectancy of the populations living in highly developed countries has been observed over recent decades. The number of people worldwide above the age of 60 is increasing at an unprecedented pace. The purpose of the study was to determine the significance of physical activity of older people in the process of successful ageing. Research methods. This article is a review of Polish and foreign studies considering the relationship between physical activity and successful ageing. The elaboration refers to the results of surveys published in the reviewed scientific journals including empirical studies mainly based on diagnostic survey. Study results. A thorough analysis identified three parts: the concept of successful ageing, the relationship between physical activity and health, and physical activity of older persons in Poland compared to their counterparts abroad. A review of the literature and documents has revealed that one of the main factors affecting successful ageing is physical activity. Conclusions. Physical activity and successful ageing are different in the assessed communities. Thus, it is necessary to monitor physical activity of older people in the context of successful ageing – in order to provide conducive circumstances to activating this social group and thus reducing social security cost.

Key words older people, physical activity, health, successful ageing

Introduction

Rising life expectancy of the populations living in highly developed countries has been observed over recent decades. This is mostly due to the civilizational development including technology and medical progress, improved sanitary and hygienic conditions, and easier access to medical care facilities. An influence on the decreasing number of premature deaths and so extended longevity is also exercised by various social campaigns encouraging to preventive medical examinations.

At the end of 2015, the total number of population in Poland was 38.5 million including 22.6% of persons above 60 years of age (Demographic Yearbook, Central Statistical Office GUS, 2016). This age is considered by the World

Health Organization to be the onset of old age. It is estimated that by the end of 2050 the percentage of persons above the age of 60 in Poland will have increased by 19%, that is, to 13.7 million people (the forecast population in Poland in 2014–2050, 2014). It is expected in the EU states that in 2060 the population rate between the ages 0 to 14 and at the age of 65 and above in relation to people aged 15–64 years will be respectively 53.5 to 25.0%. A decade ago (in 2008) this rate ranged from 25.4 to 23.3% (Giannakouri, 2008). These unfavourable proportions of persons in pre-productive age and post-productive age in comparison to people in productive age are referred to as “inverted population pyramid” by demographers.

A similar phenomenon can be observed on a global scale. In 1980, there were 378 million of people aged 60 and over in the world. Currently this number has doubled and amounts to 759 million. It is estimated that 2 milliards of persons of 60 years and more will live worldwide in 2050 (Current Status of the Social Situation, Wellbeing, Participation in Development and Rights of Older Persons Worldwide, Department of Economic and Social Affairs Office of the High Commissioner for Human Rights, 2011). The ageing society issue must result in the changes of the state policy on economy and culture as well as the health care system. These dynamic demographic and social transformations over the recent decades, considering inefficient societies, give reasons to searching for solutions conducive to successful, active ageing.

This paper is an attempt to define the significance of physical activity of older persons in the process of successful ageing.

Research methods

This article is a review of Polish and foreign studies considering the relationship between physical activity and successful ageing. The elaboration refers to the results of surveys published in the reviewed scientific journals including empirical studies mainly based on diagnostic survey. A search of relevant literature was performed in the databases of PubMed and Web of Science. Consequently, 65 articles were found and 30 of them met the adopted criteria. The overview also includes scientific monographs based on empirical studies of large groups of older persons who take up various forms of physical recreation. Materials gathered are completed with the analysis of documents (Central Statistical Office GUS, Reports, Forecasts, NPZ).

Study results

The concept of successful ageing

Gerontology is a scientific discipline which deals with the issues of broadly understood old age and ageing (from Greek *geron* – old man and *logos* – science). Gerontology literature regards old age as a static process while ageing – as the dynamic process (Brzezińska, 2011). Old age is referred to as third age, fourth age, advanced age, declining years or longevity. P. Szukalski (2013) claims that such a division of old age is justified by the fact that older persons (declining years or longevity) depend on constant care as they find it difficult to perform daily tasks on their own. As far as the persons who have just surpassed old age (early old age, advanced age, third age) are concerned, they have a couple or a dozen or so years ahead of fully efficient and independent life. P. Baltes and J. Smith (2003) consider third age to be the period between the age of 60 and 80 years. According to them, fourth age begins after 80 years of age. W. Pędich (1995) defines early old age (60–75 years) also as third age whereas late old age (over 75 years of age) as fourth age. S. Klonowicz (1979) distinguishes other age categories for men and still other for

women. Old age concerns men at the age between 65 and 79 years and women aged 60 to 79. Above this threshold (over 80 years of age), the ageing of males and females is captured jointly and referred to as a very advanced age.

Significant differences can be observed in defining the beginning of old age. Some scientists regard the age of 55 years as the onset of old age. Yet others claim that elders are people who are 65 years old and more or they propose to extend this age threshold even to 80 years. A modern 60-year old person is at least twice more likely to live to 80 years compared to his counterpart living in the early 1950s (Szukalski, 2013).

In Poland, the age of 60 is often considered to be the old age threshold and disease factors are thought to be the most important ones by gerontologists as they affect mental state and good social condition (Orzechowska, 1999).

Even psychology literature does not provide only one definition of the beginning of old age at all. The authors of these papers most frequently focus on several major aspects of old age like memory, personality, lifestyle, the meaning of life and life value (Studen, 2011; Szatur-Jaworska, Błędowski, Dzięgielewska, 2006).

According to the World Health Organisation (WHO), old age begins at 60 and can be classified into three main periods, namely, early old age (60–74) which includes people who are physically, mentally efficient and independent in most cases; late old age (75–89 years) – connected with significant limitation of psychophysical efficiency, increased demand for medical care and support of others in daily activities; advanced age, longevity (above 90 years of age) – characterized by decreased psychophysical aptitude in comparison with the preceding group (refers to those who were efficient during the previous period). WHO experts also determine a period in human life referred to as pre-old age including people aged 45–59 (Zych, 2001). The above mentioned old age classification is often applied in scientific studies. Besides, some additional terms are also used. W.W. Spirduso (1995) provides the criteria of identification of old people according to the calendar age, that is, *young-old* – 65–74 years; *old* – 75–84 years; *old-old* – 85–99 years; *oldest-old* – 100 years and more or another classification including sixty-year old persons – 60–69 years; seventy-year old people – 70–79 years; eighty-year old persons – 80–89 years; ninety-year old people – 90–99 years; one hundred- year old persons – ≥ 100 years.

The process of ageing occurs on numerous levels. Physiological ageing can be revealed by lower physical activity and reduced adaptive possibilities of human body. This process is connected with decreased efficiency of particular body functions and organs. As a result of ageing processes, physical endurance is decreasing and muscle tension of a 65-year old person accounts only for 75–85% of value achieved between the age of 20 and 30. The best results of maintaining physical endurance until old age can be achieved by continuing physical training commenced in (Górski, 2011).

It is decreased physical performance that comprises an indispensable element of old age and ageing and it is mainly affected by biological factors, deteriorating health (Studen, 2011) as well as lower physical activity. Ageing optimization is determined by lifestyle, environmental and genetic factors and medical care opportunities.

During social ageing, elders change their interests and possibilities of taking up various forms of activity. Gerontologists determine a number of activities including domestic and family, cultural, professional and social activity (Orzechowska, 1999), leisure-time and hobby-related, receptive, publicly oriented and integrational activity (Halicka, Halicki, 2002). Depending on the role, there are different lifestyles of the elderly. Leisure-time and hobby-related activity comes down to walking, sports activities, gardening, spending time in allotments. Receptive activity means watching TV and reading books usually at home. The type of activity which covers social and political involvement is publicly oriented activity. Integrational activity is based on meetings, trainings, educational activities,

social and charity engagement. The above specified types of activity comprise numerous patterns of individual and group behaviours, illustrating the abundance of lifestyles of old persons. Physical activity is reported to be of crucial importance in various types of activity and also in typologies of health styles (Nowak, 2008).

Regular exercise belongs to the most important successful ageing factors (Kaczmarczyk, Trafialek, 2007; Kostka, 2001). This term was used for the first time by R.J. Havighurst and R. Albrecht in 1953 (1953). According to M. P. McCann, L. Ward and H. Winefield (2008), successful ageing is a process of optimizing health capacities (physical, social and psychical health), which enables elders to actively participate in social life and so enjoy a good quality of life. The basic conditions of successful ageing are defined by the authors as maintaining a successful condition of health, keeping family and social relationships, education and self-realization opportunities, independent living and financial independence. Successful ageing is associated with a low risk of developing chronic diseases, infirmity and with a high level of mental and physical performance as well as life activities (Laskowska-Szcześniak, Kozak-Szkopek, 2013). On the basis of own study, J. Halicki (2008) identified the following conditions of successful ageing: health and physical performance, good relations and family bonds, social contacts and activeness, adaptation to old age, life satisfaction, objectives and dreams for the future, financial security, good disposition, independence, mental health and hobby.

The term of successful ageing is closely connected with active ageing. The concept of active ageing according to the WHO is a process which enables individuals and social groups to preserve mental and physical wellbeing, professional and social activity, independence and individuality (Active Ageing: A Policy Framework, 2002. Retrieved from http://www.who.int/ageing/active_ageing/en). In 2013, the European Union introduced the Active Ageing Index (AAI). It is a ranking which considers the most important aspects of seniors' lives in particular EU countries. The index allows for assessment of conveniences proposed by the state including but not limited to the employment rate of elders, independence, security, participation in social life, conditions conducive to active ageing. The relevant literature also mentions the term of positive ageing. According to the concept developed by R.D. Hill (2009), positive ageing connotes to using the resources available to an individual in order to optimize the experience of growing old. The resources which can be utilized for positive ageing include inborn psychical predispositions, environmental circumstances (medical procedures, access to medical and care services, housing conditions, working conditions, etc.) as well as individual features.

The relationship between physical activity of older people and their health

Physical activity means each work performed by skeletal muscles, characterized by non-resting energy expenditure. The concept of physical activity also refers to active relaxation and performing a job which together with other factors increase total daily energy expenditure. Some scientific papers differentiate habitual activity connected with everyday life, physical activity during leisure time and occupational physical activity (Bouchard, Shephard, 1994).

So far, no definition of physical activity has been developed which would be recognized worldwide (Van Der Wilk, Jansen, 2005). Human physical activity occurs during work (especially physical work), moving (walking, cycling also when commuting), performing domestic duties (cleaning, cooking, chopping wood, etc.) and during leisure time (participation in sports or recreational activities) (Report on health condition in the world, 2002, 2003). The definitions of physical activity emphasize the fact that the level of this activity depends on the standards of material, civilizational and cultural life of the society. Some of these definitions, especially the ones which highlight

recreational aspects of physical activity, refer this activity to the lifestyle and regard it as a significant element of a healthy lifestyle (Drabik, 1997; Łobożewicz, 2001; Nowak, 2008; Osiński, 2011).

Moderate physical activity of older adults implies better health. This concept, applied in medicine, psychology, sociology, physiology and physical culture, is recognized in a characteristic way for a given field of science. The most commonly used definition of health is the one developed by the World Health Organization (WHO, 1946). In its original wording, according to the World Health Organisation Constitution, health “a state of complete physical, mental and social well-being, rather than solely as an absence of disease” (Ewles, Simnett, 1985, p. 5). A peculiar attempt to combine the common and professional way of defining health is the holistic concept of health which identifies health in several dimensions. Physical health means the right functioning of the body, all its systems and organs. Psychical health includes mental health (the ability to think logically and clearly) and emotional health (the ability to recognize feeling, express them in the proper way, the ability to cope with stress). Social health – means the ability to maintain the appropriate relations with others. Spiritual health is connected with religious practices and beliefs. As a whole, health consists of a few interlinked dimensions the limits of which are not always explicit. The notion of holism in the context of health refers to an individual as a whole and in whole, in the environment, in the aspect of lifestyle and living conditions (Ewles, Simnett, 1985).

A number of studies indicate that the level of physical activity is strictly connected with health, specifically health of older persons (Grzanka-Tykwińska, Kędzióra-Kornatowska, 2010). Health should be supported by exercise for health, defined as a lifelong, usually self-controlled process (Kuński, 2003). Numerous researchers have elaborated on physical activity as the best prophylactic measures (Drabik, 1997; Charzewski, 1997; Gębska-Kuczerowska, Miller, 2006; Kostka, 2001; Lipowski, 2006; Nowak, 2008, 2010; Sygit, 2015; Szeklicki, 2007, Jopkiewicz, 1996).

Scientific studies have revealed the beneficial impact of properly dosed physical effort on the cardiovascular system, respiratory system, locomotor apparatus and improvement in cognitive functions (Drabik, 1997; Gębska, Kędzióra-Kornatowska, 2012; Kuński, 2003; Szeklicki, 2007). Regular physical activity adjusted to individual needs and capabilities is the natural ageing slowing agent (Łobożewicz, 1991; Nowak, 2010), having a favourable influence on the efficiency of the body and self-assessment of health.

In the foreign literature, the issues of pro-health physical activity also comprise the object of numerous studies (Alves et al., 2016; Blair, Kohl, Gordan, Paffenbarger, 1992; Both, 2000; Hupin et al., 2016; Parsons et al., 2016; Vasconcelos, Cardozo, Lucchetti, Lucchetti, 2016; Hart, 2016). Regular physical activity is recommended to individuals of all ages including those above 80–85 years of age. Physical activity of seniors is supposed to enhance oxygen efficiency (aerobic), promote muscle strength, improve flexibility, balance and coordination of movement. The coexistence of the aforementioned elements maintains good health and wellbeing of older persons (Lacour, Kostka, Bonnefoy, 2002). On the other hand, the Australian studies, conducted among 9 thousand adults over the age of 65 using the diagnostic survey, have revealed that health problems are the most common barrier when taking up physical activity (Lim, Taylor, 2005). The same results were obtained by German scientists (Moschny, Płyta, Klaassen-Mielke, Trampisch, Hinrichs, 2011). Valid tests concerning the pro-health impact of physical activity do not explicitly state whether physical activity is pursued by individuals who are generally healthier and whether indeed some people do not get involved in exercise due to health condition. This question could be answered if the health state of the people involved in physical activities was assessed before starting recreational exercise.

The physical activity of older people in the light of selected Polish and foreign studies

Research on physical activity of elders involves a wide range of problems within particular fields of science. This activity becomes particularly significant in the demographic situation of the Polish society. For over 30 years, studies have been conducted on physical activity of older men. Three research projects mainly regarding the risk of falls have been accomplished (Osiński, Szeklicki, 2012). On the basis of the Senior Fitness Test (Rikli, Jones, 1999) adapted to Polish circumstances, the level of motor performance was evaluated in 2494 individuals aged 65–103. The results were referred to American standards (Zieliński, Wieliński, 2012). R. Szeklicki (2007) assessed the correlation between habitual physical activity and morphological and metabolic components of physical activity connected with the health of males after 60. The author used an interview questionnaire to examine the social standard of the oldest residents of Poznań. M. Nowak (2008) undertook the issue of a healthy lifestyle of women where a crucial role was played by regular physical activity next to many other pro-health behaviours. This paper is a typology of healthy lifestyles confronting the recognized and realized life values. Kozdroń (2006) and Lipowski (2006) wrote about women's physical recreation and the reasons for pursuing such activity as well.

The "Third Age University" (TAU) program plays a significant role in the social, cultural and physical inclusion of older people. The research conducted in the TAU revealed that the students are active individuals also in terms of physical activity (70% take part in physical activities proposed by the TAU) and it is women who pursue this type of activity more often (Ziębińska, 2007).

The issue of old age and ageing is discussed in numerous Polish magazines, however not on a regular basis, for example, "Central European Journal of Sport Sciences and Medicine", „Human Movement", "Journal of Education, Health and Sport", "Journal of Human Kinetics", "Medical and Biological Sciences", "Polish Journal of Sport and Tourism" and others. Likewise, a number of foreign journals specialized in the problems of gerontology, namely, "Aging and Mental Health", "European Review of Aging and Physical Activity", "Journal of Aging and Health", "Journal of Aging and Physical Activity", „Journal of the American Geriatrics Society", "The International Journal of Aging and Human Development".

Scientific publications presented in foreign reviewed journals, only during the last two years, published numerous papers concerning physical activity of seniors (de Souto Barreto, Delrieu, Andrieu, Vellas, Rolland, 2016; Hart, 2016; Van Holle, De Bourdeaudhuij, Deforche, Van Cauwenberg, Van Dyck, 2015; Marques, Sarmiento, Martins, Saboga Nunes, 2016; Musich, Wang, Hawkins, Greame, 2016). Particular attention should be paid to the study by de Souto Barreto (2016). This elaboration examined the impact of physical activity on cognitive processes of 104,909 individuals of middle age or older. The mean time of observation of the subjects was 32 months. It has been revealed that pursuing physical activity, even infrequently (several times a month), positively influences the cognitive functions in the period of ageing.

Taking into consideration the latest scientific reports, physical activity of women in terms of its advantages has been the subject of studies in numerous countries. The Australian research involved 555 female participants born in the period 1921–1926, who reported the symptoms of depression (Heesch, Van Gellecum, Burton, Van Uffelen, Brown, 2016). Pursuing physical activity by these women could significantly improve their quality of life (HRQL test). Elderly women's physical activity issues were also discussed by A.P. Vasconcelos et al. (2016). The purpose of their studies was to assess the influence of different forms of exercises (e.g. pilates, functional gymnastics), on the physical performance of 148 women aged 60 or more. All groups involved in the research were reported to reveal significant changes before and after the exercises. M. Kim et al. (2016) examined the impact of physical activity

(PA) and physical condition (PF) on fear of falling (FOF) in 94 Korean females aged 65–79. The studies showed that agility and dynamic balance in older women, as examined by means of UNG (test 8-foot up-and-go), was the main factor affecting FOF; individuals with low UNG were clearly characterized by high FOF rate.

The impact of physical activity on the improvement of skeletal muscles of male individuals aged above 65 years has been also evaluated (Saint-Jean-Pelletier et al., 2016). It has been concluded that physical activity protects skeletal muscles partially against ageing effects and significantly affects the content and accumulation of lipids. Cross-sectional studies have been also conducted on 1216 men from the British Regional Heart Study (Parsons et al., 2016). The research has revealed that irrespective of the intensity and duration of exercises – they are beneficial to vascular centres.

A number of studies refer successful ageing to pursuing physical activity. A. Beenackers et al. (2012), using search methods, identified the studies of physical activity conducted from January 2000 to December 2010, published in such journals as: PubMed, Embase, Web of Science, Psychinfo, SportDiscus and in the service Social Abstracts. The following five areas of physical activity were identified: TPA (Total Physical Activity), OPA (Occupational Physical Activity, TLTPA (Total Leisure-time Physical Activity), VLTPA (Vigorous Leisure-time Physical Activity) and AT (Active Transport). Among 131 studies, there were 72 elaborations involving persons over the age of 60. When analysing the above paper, it is worth pointing out that studies on population’s physical activity are conducted regularly in Scandinavian countries (Denmark, Finland, Sweden) as well as in Germany, France, Switzerland and Great Britain. Table 1 reveals selected Polish studies which have examined the biggest number of individuals undertaking leisure-time physical activity.

Table 1. Physical activity as the determinant of successful ageing – selected results of Polish studies

Author and year of publication	Name of study	Number of subjects	Age of subjects	Type of physical activity
Stelmach et al (2004)	CINDI (Countrywide Integrated Noncommunicable Diseases Intervention Programme)	1,837	18–64	TLTPA
Kaleta, Jegier (2005)	Physical activity in Poland	508	42+	TLTPA
Lipowski (2006)	Physical recreation of women in Poland	1,580	16–80	VLTPA
Kaleta, Jegier (2007)	Physical activity in Poland	954	20–64	TLTPA
Szeklicki (2007)	Men’s habitual physical activity	137	>60	VLTPA
Drygas et al. (2009)	Health studies in Poland (WOBASZ project)	12,552	20–74	TLTPA
Kwaśniewska (2010)	Multi-aspect health studies (WOBASZ project)	7,280	20–74	AT
Nowak (2010)	Active lifestyle in Poland	3,662	20–75	VLTPA
Mogila-Lisowska (2010)	Leisure-time physical activity of adult Poles – conditions and style of participation	1,447	16–60	VLTPA
Jopkiewicz, Gawron (2013)	Physical performance in the context of health	1,032	20–59	–
Ministry of Sport and Tourism (2016)	Poles’ level of physical activity	1,000	>15	AT, VLTPA

Note. TLTPA (Total Leisure-time Physical Activity), VLTPA (Vigorous Leisure-time Physical Activity), AT (Active Transport).

Another elaboration, significant to this study is “Physical activity in older people: a systematic review” by F. Sun, Norman, While (2013). The data for the purpose of this article was gathered from January 2000 to April 2011 in online databases such as: The Cochrane Library, PubMed, Medline, Embase, Scopus and in several Chinese databases. In this case, the authors focused on the elaborations which considered the current guidelines

concerning physical activity. The biggest number of such studies were conducted in the United States and Australia. Sadly enough, no Polish articles were noticed by the authors during the reported period.

Summary

One of the factors influencing successful ageing is pursuing physical activity. Regular exercise delays the ageing process, for example, by hampering numerous civilisation diseases including the ones which develop as people get older. Demographic ageing of the society has paradoxically led to increased interest in the way individuals over the age of 60 function. Many government and non-government institutions and associations have been established both in Poland and abroad in order to enhance the quality of seniors' lives. Third Age Universities may serve as an illustration of such foundations. A considerable part of organizations and associations acting for the sake of seniors have physical activities included in their offer. This appears to be highly promising and hopefully may contribute not only to extended lifespan, but also to a healthy life due to active – successful ageing.

A lot of studies referred to in this paper emphasise the fact that the level of physical activity is closely connected to health. Therefore, health problems are the most common barrier when taking up physical activity, especially among older people. In the Polish and foreign literature, the issues of pro-health physical activity also comprise the object of numerous elaborations. Studies on physical activity of seniors involve a wide range of aspects within different fields of knowledge.

As a result of the conducted study it is clear that: Physical activity and successful ageing are different in the assessed communities. Thus, it is necessary to monitor physical activity of older people in the context of successful ageing – in order to provide conducive circumstances to activating this social group and thus reducing social security cost.

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