

Correlation between functional fitness of older people and environmental and accommodation conditions

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Abstract:

Physical environments in which older people live reflect the diversity of experience. This means that older peoples quality of life, and thus their health, can depend on the appropriateness of their home environment and the conditions in which they live. In our paper, we attempt to explore the association(s) between the parameters of functional fitness and the accommodation conditions among older residents living in eastern part of Slovak republic. The pooled data (n = 112) were extracted from older cohorts living in eastern part of Slovakia, research conducted in 2014. Readiness for participation in physical activity was assessed using PAR-Q (Physical Activity Readiness) questionnaire. Functional fitness by the means of SFT test (Senior Fitness Test) respectively. The association between latent variables, demographic factor, and functional fitness was determined by structural – equation modeling (SEM). The mean age for all participants was 64/65 years. A two – minute step-test of cohorts living in social service homes mean value 29 ± 20.54 versus cohorts living at home 68.71 ± 34.36 steps. In agility/dynamic balance test 11.19 ± 10.47 versus 7.03 ± 2.65 seconds respectively. The SEM model showed that accommodation conditions was directly associated with functional fitness. A two-minute step-test of cohorts living in social setting environment (P = 0.00002) versus living at home (P=0.00496). In agility/dynamic balance test (P = 0.00002) versus (P = 0.00001) respectively. That represents average and below average in the age group of 65 - 69 years of cohorts living at home compare to risk of functional fitness loss of cohorts living in social service homes. Our research gives support to the hypothesis postulating significance of mutual correlation between the social context of senior citizen life (accommodation conditions and environment), on one hand, and functional fitness, on the other.

Key words: Senior citizens, active senescence, accommodation, physical activity, functional fitness, quality of life.

Introduction

The quality of life of senior citizens is an important indicator of both nation-wide and individual aspects of social life. The identification, analysis and evaluation of possible correlations among the factors determining the quality of life of older people are preconditioned by a comprehensive approach. A dynamic and an open-nature approach significantly affect the way of treating this ever-growing population group. The paper presents certain observations that reflect the physical dimension of older cohorts, their routine physical activity and the relation between their functional fitness (resulting from physical activity) and the conditions and environment of their accommodation. Our results indicate better fitness parameters in those old-age people who live in their own home environment (Oliver et. al., 2014). The tendency towards the loss of fitness is much lower in this group of older people that live in their own home setting than in the group living in social house setting. Old age and the ageing are, respectively, the period and the process that require a comprehensive approach reflecting biological, psycho-social and economic aspects of life (Lawton, 1991, Gomes do Nascimento et. al., 2015). The quality of a senior citizen life is a multidimensional phenomenon saturated by a general feeling of satisfaction and subjective evaluation of one's life situation (Huter et. al., 2016). The criteria that play a crucial role in this respect include health and its domain, functional fitness (Rikli, Jones, 2013, Ruiz-Montero et al., 2017). Health is saturated by factors whose content is determined by health culture as a regulatory factor implying individual and social responsibility. Social responsibility means intentional support to health-related conditions and circumstances. Individual responsibility concerns respecting the principles of healthy life-style with regard to one's potential, experiences and interests. Acceptance of the determining position of an individual's health-related responsibility and behavior requires continuous regulation of one's life-style (Shephard, 1997, Swain, 2014, Kisner, 2013). This is especially true of higher age groups affected by a number of variables that can significantly improve or limit the level of health and, by implication, the quality of life (Edlin, 2014, Harper et. al., 2014). The concept of active ageing reflects the heterogeneity of the senior citizen

group in terms of regressive organism changes, health anamnesis and other circumstances of life (Dorfman et al., 2007).

Active ageing is based on the concept of independence in performing activity of daily living and ability to influence one's own life-style in a purposeful way. It implies the ambition for self-realization directed at the desired self-acceptance. All this should result in positive perception of the present and future. The synergic effect of health factors, including rational diet, emotional balance, spiritual dimension, ecological environment, positive social interaction and regular alternation of activities, has been confirmed empirically and in a number of research projects (Birren, 1991, Spirduso et al., 2005, Ballesteros et al., 2010, Nauert, 2010). Given this synergy, inherent life-style activities are an indispensable condition for senior citizen independence (Faghri et al., 2015). Positive effects of adequate and regular physical activities are important in every life-period (e.g., Evans et al., 1991, Geraedts et al., 2014., Cavill et al., 2006., Brodani et al., 2015., Brodani et al., 2016). It is necessary to take into consideration physical experiences, skills, physical condition, and possible health restrictions. Regular physical activities reduce the risk of cardio-vascular diseases, type 2 diabetes, high blood pressure and cancer of large intestine etc (Windsor et al., 2015., Mora et al., 2007). In addition, they increase bone density, improve the immunity system, reduce the occurrence of osteoporosis (Warburton et al., 2010., Shephard et al., 1994). Furthermore, they have an anti-depressive effect, reduce the frequency of hospitalization, etc. (cf. Hendl - Dobrý et al., 2011). Physical activities are a substantial part of external stimulation that supports the complex of adaptation responses, maintains or even improves the functional fitness of an individual, protects seniors' citizens against regression in both the biological system and the psycho-social life of a personality (Li et al., 2013, Tong et al., 2013, Blondell et al., 2014).

Material & Methods

Sample of respondents: The sample of respondents consisted of two groups of senior citizens. They were selected according to selected characteristics (age - 64/65). The first group consisted of seniors (n = 57) living in a retirement home (retirement home of Juraja Schopera 3454, Rožňava, Huta, 04801 Rožňava, Subsidium – special-purpose retirement home. Retirement home, Betliarská 18, 04801 Rožňava, and retirement home, Ružová 433/8 07631 Streda Nad Bodrogom). The second group (age - 64/65) consisted of senior citizens from Prešov, Košice, Rožňava and Trebišov (n = 55) living at home. All of the mention facilities are located in Slovakia.

The research project feasibility was conditioned by the identification of the respondents' health condition: their readiness to take part in physical activities. It was examined by means of the PAR-Q (Physical Activity Readiness) questionnaire. The research was implemented in June and December, 2014. *Study's aims:* Is there any relation between the accommodation conditions (home environment, social services homes) and the functional fitness parameters (physical activity result) in senior citizens? Our research question - Is there any significant correlation between the functional fitness of senior citizens (physical activity result) and the accommodation conditions and environment (home environment, social services homes)? Objective of the research is aimed at the identification of a possible association relationship between the parameters of functional fitness and the accommodation conditions of senior citizens. We hypothesis that the level of functional fitness parameters in senior citizens living at home environment is significantly higher than that in senior citizens living in social service homes. *Procedures:*

The research hypothesis concerning the relation between the variables (manipulation with an independent variable was not part of our research) was examined by means of two standardized SFT subtests (Rikli et al., 2013), that establishes the criterion and the reference standard for senior population. One of the selected SFT subtests (2-minute step test) examined aerobic endurance (the ability to sustain large muscle activity over time) that is necessary to perform many activities of daily living, activities such as walking, participating in recreational or sport pursuits. How much work our bodies can do and how much energy we have is related to how much oxygen we can take in and use. Maintaining an adequate level of aerobic activity has both a direct effect on a person's functional mobility and an indirect through its role in helping to reduce, obesity, high blood pressure, some forms of cancer etc.

The second (8-foot up and –go test) test examined agility and dynamic balance that combined agility (involving speed and coordination) and dynamic balance (maintain postural stability while moving) that is important for a number of common mobility tasks that require quick maneuvering in performing activities of daily living, tasks related to gait speed not the last the safe participation in many recreational activities. Although agility and dynamic balance represents two different components in fitness and should be evaluated separately, we are treated them as one composite measure since both must work together for the successful performance of many everyday activities. The selected subtest presents a quantitative research paradigm and meets the attributes of validity, reliability and practicality in monitoring the selected parameters. 2-minute step subtest. Purpose: To assess aerobic endurance.

Description: Number of full steps completed in 2 minutes, raising each knee to a point midway between the patella and iliac crest. The score is the number of times the right knee reaches the required height. Agility/dynamic balance subtest. Purpose: To assess the agility and dynamic balance.

Description: Number of seconds required to get up from a seated position, walk 8 feet (2.44 meters), turn, and return to seated position. *Statistical analysis:* The significance of differences (variable measurements) in the selected functional fitness parameters, i.e., the normality of distribution in the functional fitness subtest, was evaluated by means of Shepiro-Wilkovov W-test. The research results were processed in a descriptive and relational way, which was followed by synthesis and generalization (Cimboláková et al., 2015).

Results

Our research gives support to the hypothesis postulating significance of mutual correlation between the social context of senior citizen life (accommodation conditions and environment), on one hand, and functional fitness, on the other. Some of the results, relevant to our research objective are given below. Respondents living in social service homes:

SFT-subtest: Step-test, *A test examining aerobic endurance* – a two-minute step-test: the average of 29 steps indicates the *risk of functional fitness loss*. This applies to all age categories Fig. 1.

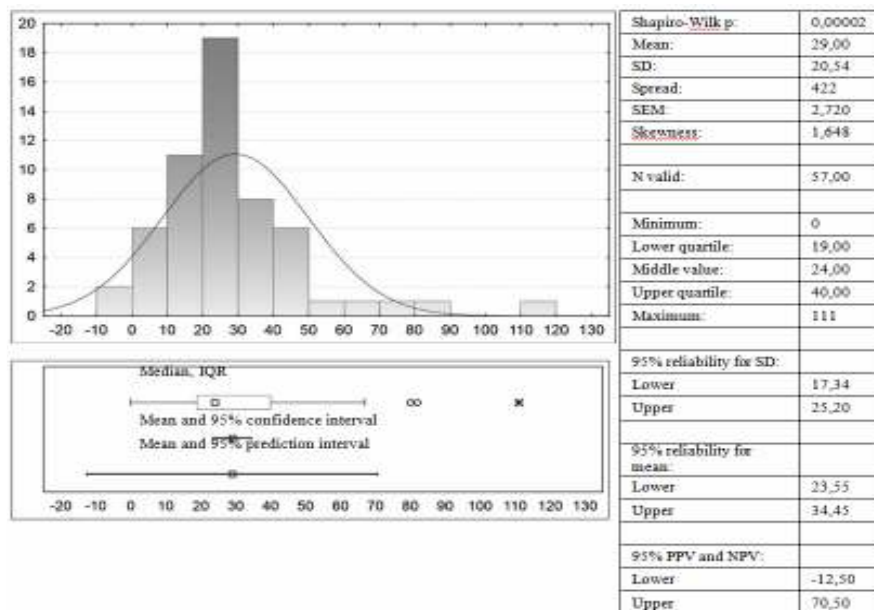


Fig. 1. Step-test of cohorts living in social service homes

SFT-subtest: Walk in seconds – *A test examining agility/dynamic balance* – walking around a cone: the average value is 11,18 sec., which indicates the *risk of functional fitness loss*. This applies to all age categories – Fig. 2.

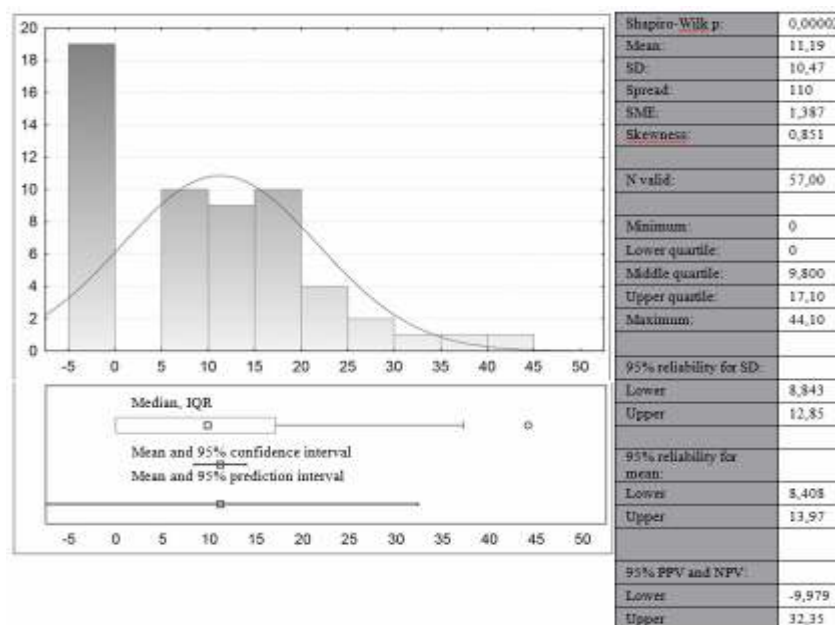


Fig. 2. Agility and dynamic balance test of cohorts living in social service homes.

The functional fitness test results in senior citizens living in social service homes (step test, walk in seconds) can be compared to the valid criteria and referential standards for various age groups of senior populations. Their comparison indicates *possible risk of functional fitness loss*.

Our observations (findings) suggest a tendency (based on reflecting physical activities in one's life-style in the preceding stages of life, individual nature of the phenomenon of ageing, etc.) towards aggravated functional fitness as a comprehensive respondents' potential. The results draw our attention to the psycho-social context of life of senior citizens in social service homes in which the conditions for influencing the motor and somatic parameters are determined (limited) by the nature of accommodation.

Respondents living at home:

SFT– subtest: Step-test - *A test examining aerobic fitness* – a two-minute step-test: the average value of 68 steps is below average in the age group of 65 – 69 years and an average in the age group of 70 – 94 years – Fig. 3.

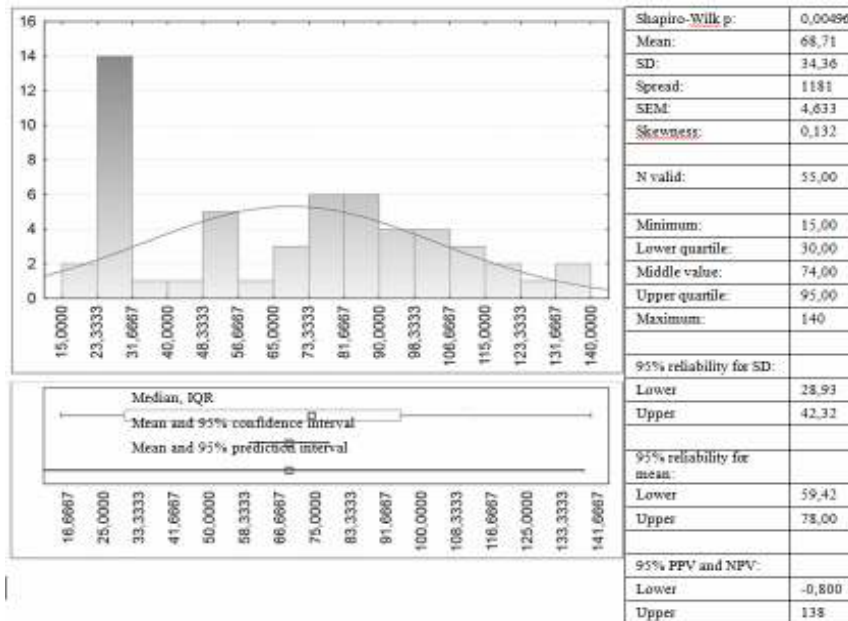


Fig. 3. Step-test of cohorts living at home

SFT-subtest: Walk in seconds – *A test examining agility/dynamic balance* – walking around a cone: the average value is 7.0 sec., which means average for agility and dynamic balance. This applies to all age groups – Fig. 4.

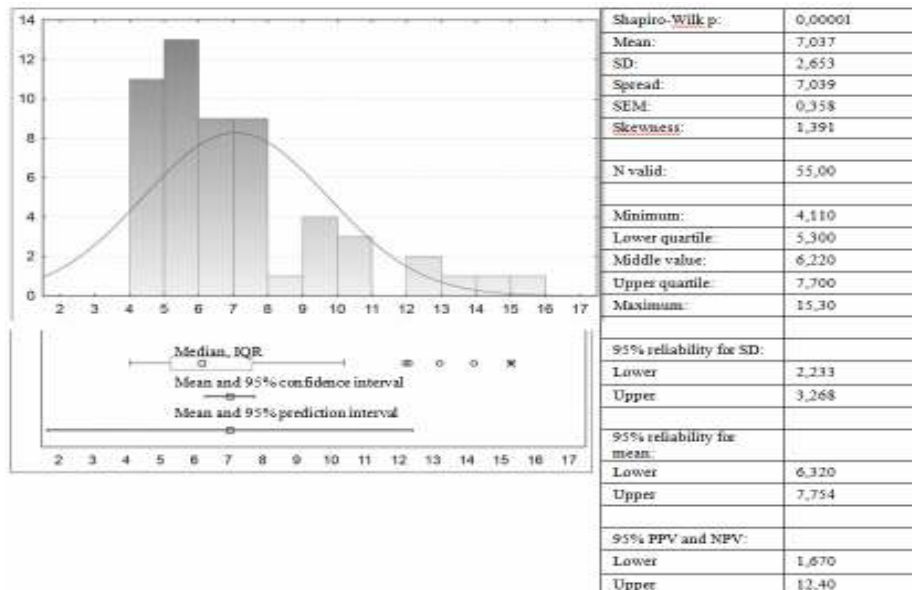


Fig. 4. Agility and dynamic balance test of cohorts living at home

The functional fitness test results in senior citizens living at home (step test, walk in seconds) can be compared to the valid criteria and referential standards for various age groups of senior populations. Their comparison indicates *average values, i.e., maintaining an average level of functional fitness*.

Our observations (findings) indicate the actual need, ambitions and interest of senior citizens living at home to live an active and independent life and to be responsible for coping with their own life situations. Our findings indicate significant effects of accommodation conditions and environment upon maintaining physical routines and functional fitness, so vital to active ageing.

Discussion

A comparison of the functional fitness parameters in the examined groups of respondents shows better results and, by implication, more positive perspective for the group of senior citizens who live at home. The risk of functional fitness loss is much lower in this group than in the group of senior citizens living in social service homes. These findings *give support to our hypothesis* postulating better functional fitness results for the group of senior citizens living at home. While realizing the complexity of the process of ageing it may be concluded that regular and adequate physical activity is indispensable for healthy life-style (Eifert et. al., 2014, Langlois et. al., 2013, Paillar et. al., 2015). Our research was focused on the accommodation conditions of senior citizens as a variable that affects the functional fitness of senior citizens. We pursued verification of causal relationships between variables and subsequent objectification of the influence of accommodation conditions upon the functional capacity, i.e., health of the respondents. We are aware of the fact that the objectivity of our findings and their interpretation may have been influenced by undesired variables, such as circumstances and events that had not been reflected in our research, for example, reasons for being accommodated in a social service home, characteristic features of the former and the current life-style, social position, family relations, etc. We are well knowing of these facts that are difficult to reflect due to natural circumstances of life. Therefore, we attempted to carefully control possible effects of undesirable variables and objectively interpret the results by precise and careful preparation, correct cooperation and personal implementation of measurements.

Conclusions

Adequate and regular physical activity is one of the fundamental conditions of health and dignity of the organism as a whole (Kelly et. al., 2014, Erickson et. al., 2013). The ability to perform physical activity more specifically activity of daily living, is an important general criterion for assessing the mental, social and physical health condition of senior citizens (Malovič, 2011). Although physical fitness traditionally has been associated more with younger age groups than older people, it is most crucial during the senior years. In fact, studies suggest that much of the physical frailty commonly associated with aging could be reduced if we paid more attention to our physical activity and fitness as we age, and especially if any evolving weaknesses could be detected and treated early on (Ostir et. al., 2004., Garatachea et. al., 2017, Pareja-Galeano et. al., 2015). Moreover, we recognize that physical fitness represents only one of the multiple factors related to holistic approach to health, environment in which we live represents further factor (Kimáková et. al., 2015). According to disability models, physical impairment resulting from either pathology or disuse is the initial stage in the progression to disability (Bonsdorff, 2009, Bonsdorff et. al., 2011, Ferrucci et. al., 2016). Physical impairment, in turn, leads to functional limitation, which eventually can lead to disability. Therefore, identifying the key attributes associated with functional mobility, examined factors related to decision respectively inevitability of the older cohort transition to social housing, actual living in social house setting can assist in determinations of contributing factors related to functional mobility in older adults. After all we can speculate also benefits of living in the residents of Long life living residential home that may include better understanding and early recognition of frailty and identification of older adults with (temporary or permanent) special needs. Followed by timely created comprehensive personal fitness program that will includes overcome various obstacles that prevent older person from following healthy behavior (e.g. healthy eating combine with regular physical activity and meaningful social contact). Strong social support system an active lifestyle in old age residential home might prevent of delay loss of cognitive function associated with aging or neurodegenerative diseases. Applying positive psychology's principles set by professionals in social home setting older cohorts can enhance biological, psychological and social homeostasis support overall health and longevity. Therefore, living in Long life living residential home under certain conditions may not be as disadvantageous. Lastly, the quality of life of senior citizens is an important indicator of social and individual life. Search, analysis and evaluation of possible correlations among factors determining the life of senior citizens represents a complex, theoretically and empirically important set of questions whose dynamics, open nature and results significantly affect the approach of society to this ever-growing population segment. From our perspective studies investigating environment, accommodation and functional fitness can be valuable indicator of overall quality of life of older cohorts. Therefore, incorporating these domains to the prospective study can be valuable. For the future, more research is needed to provide evidence that environment, accommodation condition and functional fitness are significantly interrelated.

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