Baltic Journal of Health and Physical Activity

Volume 8 | Issue 2 Article 6

2016

Physical activity in youth and level of kinesiophobia in older adults

Edward Saulicz
Department of Kinesiotherapy and Special Methods of Physiotherapy, The Jerzy Kukuczka Academy of Physical Education, Katowice, Poland; The Academy of Business, Dąbrowa Górnicza, Poland

Andrzej Knapik
School of Health Sciences, Silesian Medical University, Katowice, Poland

Mariola Saulicz
The Academy of Business, Dąbrowa Górnicza, Poland; Department of Physiotherapy in Internal Organ Diseases, The Jerzy Kukuczka Academy of Physical Education, Katowice, Poland

Pawel Linek
Department of Kinesiotherapy and Special Methods of Physiotherapy, The Jerzy Kukuczka Academy of Physical Education, Katowice, Poland, linek.fizjoterapia@vp.pl

Jerzy Rottermund
Department of Physiotherapy, High Administration School, Bielsko-Biała, Poland

See next page for additional authors

Recommended Citation

Saulicz E, Knapik A, Saulicz M et al. Physical activity in youth and level of kinesiophobia in older adults. Balt J Health Phys Act. 2016; 8(2): 64-77. doi: 10.29359/BJHPA.08.2.06

Physical activity in youth and level of kinesiophobia in older adults

Authors

Edward Saulicz, Andrzej Knapik, Mariola Saulicz, Pawel Linek, Jerzy Rottermund, Tomasz Wolny, and Andrzej Mysliwiec

Baltic Journal of Health and Physical Activity 2016;8(2):64-77
Journal of Gdansk University of Physical Education and Sport in Gdansk
e-ISSN 2080-9999

ORIGINAL

Physical activity in youth and level of kinesiophobia in older adults

Authors' Contribution:
A Study Design
B Data Collection
C Statistical Analysis
D Data Interpretation
E Manuscript Preparation
F Literature Search
G Funds Collection

Edward Saulicz[1,2 ABDEF], Andrzej Knapik[3 ABDFG], Mariola Saulicz[2,4 ABDFG], Paweł Linek[1 BCDE], Jerzy Rottermund[5 BDFG], Tomasz Wolny[1,2 BEFG], Andrzej Myśliwiec[1 BEFG]

[1] Department of Kinesiotherapy and Special Methods of Physiotherapy, The Jerzy Kukuczka Academy of Physical Education, Katowice, Poland
[2] The Academy of Business, Dąbrowa Górnicza, Poland
[3] School of Health Sciences, Silesian Medical University, Katowice, Poland
[4] Department of Physiotherapy in Internal Organ Diseases, The Jerzy Kukuczka Academy of Physical Education, Katowice, Poland
[5] Department of Physiotherapy, High Administration School, Bielsko-Biała, Poland

abstract

Background Previous physical activity may be a significant motivator for activity at an elder age. There is a lack of research regarding the kinesiophobia phenomenon in the elderly across a wide spectrum of its conditions. The purpose of this study was to investigate the level of kinesiophobia in older adults in the context of their physical activity in youth.

Material/Methods The research was performed on a group of 520 people between 65 and 87 years old. Psychometric tools completed by the subjects were used. The tools consisted of two parts: a survey concerning the level of physical activity during childhood and youth as well as the Kinesiophobia Causes Scale. The Kinesiophobia Causes Scale allows researchers to determine the level of physical activity barriers across two domains: biological and psychological.

Results The lowest level of kinesiophobia in all of the examined areas (biological and psychological domains) was observed in women and men who, in their youth, were physically active ($p < 0.0001$).

Conclusions The results suggest that the level of physical activity during childhood and youth has a significant impact on the level of kinesiophobia at the older stages of human life.

Key words kinesiophobia, physical activity, older people

article details

Article statistics **Word count:** 4,548; **Tables:** 2; **Figures:** 1; **References:** 30
Received: July 2015; **Accepted:** March 2016; **Published:** June 2016

Full-text PDF: http://www.balticsportscience.com

Indexation: AGRO, Celdes, CNKI Scholar (China National Knowledge Infrastructure), CNPIEC, De Gruyter - IBR (International Bibliography of Reviews of Scholarly Literature in the Humanities and Social Sciences), De Gruyter - IBZ (International Bibliography of Periodical Literature in the Humanities and Social Sciences), DOAJ, EBSCO - Central & Eastern European Academic Source, EBSCO - SPORTDiscus, EBSCO Discovery Service, Google Scholar, Index Copernicus, J-Gate, Naviga (Softweco, Primo Central (ExLibris), ProQuest - Family Health, ProQuest - Health & Medical Complete, ProQuest - Illustrata: Health Sciences, ProQuest - Nursing & Allied Health Source, Summon (Serials Solutions/ProQuest, TDOne (TDNet), Ulrich's Periodicals Directory/ulrichsweb, WorldCat (OCLC)

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of interest: Authors have declared that no competing interest exists. Local Ethics Committee, The Jerzy Kukuczka Academy of Physical Education in Katowice Ethics Committee approved this study. Participants gave written informed consent before data collection began.

Corresponding author: Dr Paweł Linek, Department of Kinesiotherapy and Special Methods in Physiotherapy, The Jerzy Kukuczka Academy of Physical Education, 40-065, Mikolowska 72B, +48 661 768 601; e-mail linek.fizjoterapia@vp.pl

INTRODUCTION

Kinesiophobia (fear of movement) is a psychological phenomenon that has become a research problem for a growing number of scientists [1–6]. The researchers increasingly look into the relationship between a fear of movement and the severity of somatic sensations (pain), extending the search to other diseases [7–16]. A common feature of these studies is a clear correlation between the fear of movement and the occurrence and severity of pain. It results from a behavioural approach to kinesiophobia, which is a consequence of Kori's primal definition of this phenomenon [17].

Without questioning the role of pain in the formation and accumulation of fear of movement, it seems that such an approach to kinesiophobia does not fully exhaust the causes or signs of this phenomenon. Anxiety, whether we were more or less aware of it, has accompanied us throughout our lives, and it is always based on the need for security. Typical symptoms of anxiety in the case of physical activity are uncommon, due to the fact that the lack of physical activity belongs to the category of avoiding behaviours. In the case of physical activity, we are dealing with a more or less conscious rationalisation reaction ("lack of time", "no immediate results"), denial (removing the need for activity from one's awareness) or reaction formation (e.g. cheering) [18, 19].

Kinesiophobia, treated as a disposition of personality, is included in the categories of avoidant behaviours [14]. According to the authors of this study, it should be regarded as not only the fear of pain, but much more broadly, as the fear of being the consequence of physical activity – the feeling of physical and/or psychological discomfort (pain, fatigue, exhaustion, ridicule because of the lack of physical efficiency, the negative perception of forms of activity by the community). The questionnaire used in the research, the Kinesiophobia Causes Scale (KCS) [3], can comprehensively diagnose the spectrum of possible biological and psychological barriers to taking up physical activity, as well as their degree of severity, despite the necessary reductionism [4, 20].

The problems regarding the kinesiophobia phenomenon among the elderly is rarely undertaken in research, and even if it is addressed, it is often addressed in terms of its relationship with chronic pain. In this study, the authors focus on the evaluation of the clinical usefulness of the questionnaire Tampa Scale for Kinesiophobia (TSK-11) [21] and Fear Avoidance Beliefs Questionnaire(FABQ) [22]. The kinesiophobia phenomenon and its determinants in the elderly were not subjected to analysis in this study. An exception is research by Vincent et al. [23] and Knapik et al. [20]. In the research carried out by Vincent et al. a relationship between the results of the TSK questionnaire and pain during walking in obese older persons with chronic low back pain (LBP) was found. However, in their studies, they did not find a relationship between the level of kinesiophobia and walking endurance. Knapik et al., on the other hand, showed a high, negative relationship between the biological and psychological domains of kinesiophobia and the level of habitual physical activity in women over the age of 60 years. It indicates a lower level of fear of movement in physically active elderly women [20].

Previous physical activity may be a significant motivator for activity at an elder age. It is explained in the continuity theory. It claims that a human being has an inclination to lead the current lifestyle, both in respect of forms

of spending free time as well as habits, such as nutrition and hygiene [24]. Therefore, bearing in mind the total lack of research regarding the kinesiophobia phenomenon in the elderly across a wide spectrum of its conditions, the aim of this study was to determine the impact of past levels of physical activity (in childhood and youth) on the current sense of kinesiophobia among older women and men. In addition, the recurrence of KCS questionnaire was evaluated amongst the elderly. For this study, the inhabitants of southern Poland were examined.

MATERIAL AND METHOD

PARTICIPANTS

The research was performed using a group of 520 people (326 women and 194 men) between the ages of 65 and 87 (mean = 70.9 ±5.3). The participants were from southern Poland (from three provinces: Opole, Upper Silesia, Little Poland). The research was carried out from April 2013 until June 2014. The characteristics of the subjects are presented in Table 1. The selection of the subjects was random, and the criteria for being included in the research were: being over 64 years old (i.e. an older adult) and the level of intellectual and manual performance sufficient to complete the questionnaire. In order to include subjects that were potentially healthy, the recruitment efforts did not take place in hospitals, clinics or doctor's rooms.

PROCEDURE

The subjects independently completed the psychometric tools (method: paper-pencil). The tools consisted of two parts: the survey and the KCS questionnaire [3]. The introductory analysis included basic biometric data (gender, age, current weight and height), as well as information about the level of physical activity in childhood and youth. In the question about physical activity in the past, the subjects had one of three options to choose from:

1. In childhood and youth, my physical activity was above average – I practised sports actively in a sports club or association.

2. In childhood and youth, my physical activity was similar to that of my peers. However, I did not practise sports actively in a sports club or association.

3. In childhood and youth, I was significantly less physically active than were my peers.

The answers to these questions allowed for dividing the respondents into three groups: a group of men and women who, in their childhood and youth, were physically active above the average (n = 92), the group that participated in an average level of physical activity during youth (n = 271), and a group of women and men who, in their childhood and youth, were not physically active (n = 157).

In order to evaluate the repeatability of the responses obtained during the first test, every 10th respondent was asked to fill out an identical questionnaire after four weeks. In the process of completing the first questionnaire, the subjects were not aware that they would have to fill it out again after four

weeks. Due to the difficulties with contact with four persons, only 48 repeated surveys were collected (25 questionnaires from men and 23 questionnaires from women), which were compared with responses obtained in the first study.

All of the procedures were compliant with the Helsinki Declaration and were approved by the local Medical Ethics Committee.

MEASURE

The KCS questionnaire used to evaluate the level of kinesiophobia enabled us to determine the level of physical activity barriers across two domains: biological and psychological. Each domain includes four factors, and the answers are graded using a scale from 0 to 100. The aim of the scale is to determine the level of intensification of the barriers when physical activity is undertaken (see the Appendix). Half of the sum of both domains, biological and psychological, constitutes the overall index of kinesiophobia [3].

The calculations for the individual causes of kinesiophobia are performed as follows:

Morphologic = items (1 + 2) / 2 Individual need for stimulation = items (3 + 4 + 5) / 3
Energetic substrates = items (6 +7 + 8a + 8b + 8c + 9) / 6
Power of biological drives = items (10 + 11) / 2
Self-acceptance = items (12 + 13a +13b +13c + 14) / 5
Self-assessment of motor predispositions = items (15 + 16) / 2
State of mind = items (17 + 18) / 2
Susceptibility to social influence = items (19 + 20) / 2

The calculations of the score in the biological and psychological domains, as well as the total KCS score, are performed as follows:

Biological Domain = (1 + 2 + 3 + 4) / 4
Psychological Domain = (5 + 6 + 7 + 8) / 4
KCS Total Score = (Biological Domain + Psychological Domain) / 2

STATISTICAL ANALYSIS

Basic parameters (age, height, weight, BMI) were assessed using a two-way analysis of variance (independent variables: gender, group). The two-way analysis of variance (ANOVA) was also used to assess the differences between the average scores of the KCS questionnaire (dependent variable) and gender, group (independent variables).For significant results, the post hoc Tukey's analysis was performed. The results are presented as a mean and 95% confidence interval (CI). For all analyses, the threshold of the p value considered as significant was set at <0.05. In order to evaluate the KCS repeatability of the selected sample, the percentage of consistent responses was calculated in the repeated study in relation to the initial examination.

RESULTS

PARTICIPANTS

In our sample, regardless of the studied group, men were older by an average of 1.83 years (95% CI 0.92–2.75), compared to the studied women (main effect–gender: $p < 0.001$). Body weight was also higher by 9.18 kg (95% CI 7.05–11.31) in male subjects (main effect – gender: $p < 0.001$). For these variables, there were no effects of group or the interaction of sex x group ($p > 0.05$). In the case of body height, the main effect of gender and group was demonstrated, as well as the interaction effect (in each case $p < 0.001$). A detailed post hoc analysis showed that, in general, the men were taller, on average, by 9.19 cm (95% CI 8.19–10.2). It was also found that women that were active in sports were taller by an average of 3.5 cm (95% CI 1.60–5.12) than were moderately active and inactive women. In men, these differences in body height were not observed. For BMI, no intergroup differences were observed (in each case $p > 0.05$). The average values of the reported parameters for each group are given in Table 1.

Table1. Demographic data of the participants

Characteristics	Participants (n = 520)					
	active group (n = 92)		moderate group (n = 271)		inactive group (n = 157)	
	women (n = 58)	Men (n = 34)	women (n = 163)	men (n = 108)	women (n = 105)	Men (n = 52)
Age (yr)	69.5 (4.9)	72.4 (4.2)	70.2 (4.7)	71.4 (5.4)	70.6 (5.2)	73.1 (6.3)
Weight (kg)	71.2 (12.0)	81.8 (15.8)	72.5(10.5)	82.4 (10.6)	72.0 (10.3)	78.9(13.5)
Height (cm)	167.0 (4.7)	172.5 (5.8)	161.8(5.2)	172.3 (6.1)	162.1 (5.4)	171.2(5.7)
BMI	25.6 (4.6)	27.7 (5.4)	27.7 (3.8)	27.9 (3.6)	27.3 (3.8)	26.8 (3.8)

REPEATABILITY OF THE ANSWERS

Figure 1 shows the percentages of consistent responses between the first and second surveys for all questions included in the survey. With the exception of questions 8C, 15 and 16 (70% consistent answer), there was an average of 80% consistency of answers to the questions contained in the questionnaire after four weeks (28 days).

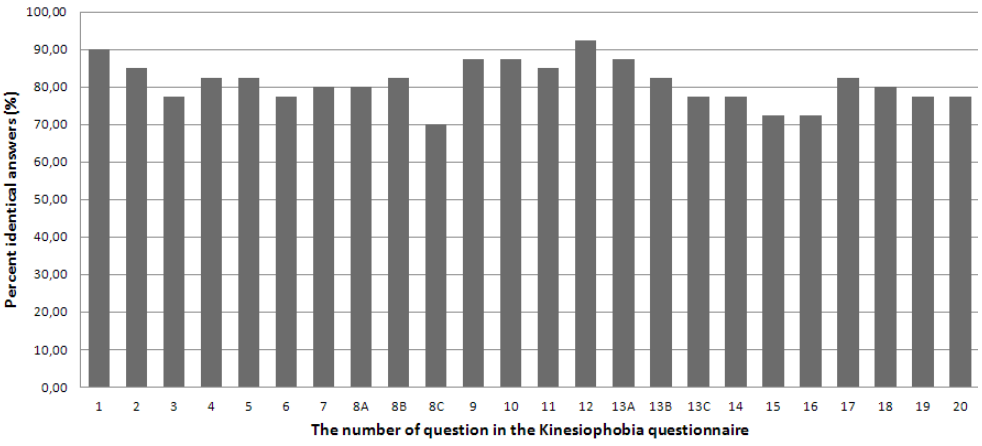

Fig. 1. Percentage of identical answers in the individual questions of the questionnaire KCS

PHYSICAL ACTIVITY LEVEL VS. KCS

Table 2. Means and standard deviations of results of the questionnaire KCS

		Active group		Moderate group		Inactive group		p value from ANOVA		
		W	M	W	M	W	M	Gender	Group	Interaction
Kinesiophobia Causes Scale (KCS)	Mp	22.2 (29.6)	17.6 (20.9)	29.3 (24.4)	26.4 (23.8)	45.2 (28.7)	31.3 (31.3)	**	***	0.13
	INS	41.0 (21.3)	45.3 (23.5)	46.3 (18.3)	49.7 (21.3)	50.1 (19.3)	56.3 (21.2)	*	***	0.81
	ES	35.4 (24.7)	32.4 (26.5)	42.8 (25.1)	43.1 (23.3)	56.7 (27.5)	51.7 (25.5)	0.31	***	0.59
	PBD	34.3 (23.1)	27.9 (18.0)	45.6 (24.2)	38.3 (23.1)	57.7 (22.2)	50.5 (26.7)	**	***	0.98
	BD	33.2 (15.7)	30.8 (16.6)	41.0 (14.6)	39.4 (15.6)	52.4 (16.1)	47.7 (18.6)	0.06	***	0.59
	Sa	30.8 (28.1)	33.8 (24.7)	46.8 (28.4)	36.7 (26.3)	54.9 (27.3)	49.5 (27.5)	0.13	***	0.15
	SAMP	12.5 (11.9)	14.7 (13.9)	44.8 (11.0)	46.5 (7.8)	79.2 (13.2)	75.7 (12.0)	0.88	***	0.07
	SM	40.1 (27.3)	44.9 (26.0)	56.1 (21.0)	51.4 (21.6)	65.5 (24.4)	56.2 (25.7)	0.19	***	0.09
	SSI	43.1 (26.3)	41.9 (21.7)	52.9 (22.1)	62.5 (24.8)	74.0 (20.1)	69.2 (23.0)	0.60	***	**
	PD	31.6 (16.2)	33.8 (13.0)	50.2 (14.2)	49.4 (12.2)	68.4 (15.2)	62.7 (12.6)	0.31	***	0.09
	KCS	32.4 (14.0)	32.3 (12.9)	45.6 (12.6)	44.4 (12.4)	60.4 (14.4)	55.0 (14.1)	0.09	***	0.24

*p<0.05; **p<0.001; ***p<0.0001; W- women; M- men

Mp – Morphological, INS – Individual Need for Stimulation, ES – Energetic Substrates, PBD – Power of Biological Drives, BD – Biological Domain, Sa –Self-acceptance, SAMP – Self-Assessment of Motor Predisposition, SM – State of Mind, SSI – Susceptibility to Social Influence, PD – Psychological Domain, KCS – total score of Kinesiophobia Causes Scale

In both genders, there was an increase of 20.1 (95% CI 11.8–28.4, $p < 0.0001$) in the morphological parameter values (Mp) in persons that were physically inactive in the past, as compared to active persons. There was also an increase of 12.5 (95% CI 6.12–18.8, $p < 0.0001$) in subjects that were inactive in youth as compared to those that were moderately active. Generally, however, women show a higher Mp value of 7.1 (2.31–11.7, $p < 0.001$).

In the case of Individual Need for Stimulation (INS), the influence of the main effect of gender and group was also demonstrated. A detailed analysis demonstrated that subjects that were physically inactive in their youth show a greater INS value, by 9.51 (95% CI 3.15–15.9, $p < 0.001$), as compared to physically active persons.

Regardless of the past physical activity, the value of the parameter increased by 4.12 (95% CI 0.53–7.71) in the male group. On the other hand, the value of Energetic Substrates (ES) parameter was higher by 8.63 (95% CI 1.29–15.9) in the group of those that were physically active in youth relative to the group that was moderately active and by 20.8 (95% CI 12.8–28.8) as compared to the physically inactive participants. In the group of individuals that participated in moderate physical activity in the past, this parameter was lower by 12.1 (95% CI 6.01–18.2) as compared to the physically inactive group.

The results for the Power of Biological Drives (PBD) are shaped similarly, where in those that were physically active in youth, the value of this parameter is lower by 10.7 (95% CI 3.98–17.5) than in the case of individuals that participated in moderate physical activity, and by 23.4 (95% CI 16.1–30.8) as compared to physically inactive individuals. Those that were moderately physically active in youth had a lower PBD by 12.6 (95% CI 7.01–18.3) than

did those that were physically inactive. A PBD value exceeding 7.73 (95% CI 3.56–11.9) was observed in women.

The Biological Domain (BD), which is estimated from the above-described variable components, also shows a significant intergroup difference. This parameter in a group of subjects who were physically active in youth is lower by 8.01 (95% CI 3.43–12.6) as compared to the value of those moderately active, and by 18.4 (95% CI 13.5–23.4) as compared to those that were inactive. In the group of individuals that were moderately active in the past, BD was lower by 10.4 (95% CI 6.62–14.2) as compared to those that were inactive.

The value of the Self-acceptance (Sa) variable in a group of subjects that had a physically inactive past was higher by 10.3 (95% CI 3.71–16.9) as compared to the moderately active group, and by 21.8 (95% CI 12.5–29.8) compared to the physically active group. Those that were physically active in their youth had a Sa value that was lower by 10.9 (95% CI 2.9–18.8) than those that were moderately active.

The Self-Assessment of Motor Predisposition (SAMP) parameter in the group that was physically active had a lower value by 32.2 (95% CI 28.9–35.4) as compared to the group that was moderately active, and by 64.7 (95% CI 61.1–68.3) than those that were physically inactive. In the group of moderately active participants, the SAMP was lower by 32.5 (29.8–35.3) over the inactive group.

The value of the State of Mind (SM) variable was lower in the group of subjects that were physically active in the past by 12.4 (95% CI 5.6–19.2) than in the case of the group of moderately active individuals, and by 20.6 (95% CI 13.2–27.9) over the inactive group. The group of those that were moderately active in youth had a lower SM value by 8.2 (95% CI 2.5–13.8) than did physically inactive subjects.

In a group of women that were physically active in their youth, the variable value Susceptibility to Social Influence (SSI) was significantly lower 30.9 (95% CI 19.9–41.9) than in the case of females that were physically inactive in the past. In turn, the variable SSI in women that were moderately active in their youth was lower by 21.1 (95% CI 12.7–29.6) than that in the case of inactive women. In the case of men that were physically active in the past, the SSI value was an average of 20.6 (95% CI 7–33.8) and 27.3 (95% CI 12.4–42.2) lower in comparison to moderately active and inactive men, respectively. In addition, women that were moderately physically active in youth had significantly lower, by 9.6 (95% CI 1.21–17.9), SSI scores than men that were moderately active in the past.

The Psychological Domain (PD), which is estimated from the above-described variable components, also shows a significant intergroup difference. This parameter in a group of subjects less physically active in the past was 17.4 (95% CI 13.4–21.5) lower as compared to the moderately active group, and was 34.0 (95% CI 29.6–38.5) lower as compared to those that were inactive. In the group of subjects that were moderately active in the past, PD was lower by 16.6 (95% CI 13.2–19.9), as compared to those that were physically inactive in youth.

The total score of the Kinesiophobia Causes Scale (KCS) in patients that were physically active in youth was lower by 12.7 (95% CI 8.9–16.6) and by 26.2 (95% CI 22.1–30.4) as compared to the subjects that were moderately physically active and physically inactive in the past, respectively. In addition, individuals that were moderately physically active in youth had lower, by 13.5 (95% CI 10.3–16.7) KCS value, in relation to the persons that were physically inactive in youth.

DISCUSSION

The tool used in the psychometric research – the KCS questionnaire – has a high level of repeatability. The retest that was conducted after four weeks showed an average of up to 80% compliant responses. The lowest repeatability of responses, i.e. 70%, concerned the assessment of continuous cycling for 30 min. (question 8c). The highest was 92.5%, and regarded the acceptance of one's appearance. The high repeatability of responses to the KCS questionnaire points to its usefulness in assessing the barriers for the elderly when undertaking physical activity.

Already at a cursory analysis of the results, the cascading nature of their distribution draws attention. The results of both the individual parameters making up the two domains, the domains themselves (biological and psychological) and the overall rate of KCS shaped so that in all cases the lowest values were recorded among women and men that were physically active in childhood and adolescence above the average, and the highest values were recorded in those who were physically passivein the past.

The biggest differences between those who practiced organised sports during childhood and youth (sports club or associations) were found in the Psychological Domain. In women that were above-average in terms of being physically active in the past, the value of the domain was more than twice lower (2.2 times) as compared to women that were not physically active in their youth. In men that were physically active in their youth, the value of this domain was by 28.9 (1.86 times) lower as compared to men that were physically passive in the past.

The difference between the two extremes was seen as lower and similar in women and men due to the group activity in the Biological Domain (lower values by 57.83% in women and 54.87% men). As a result, the overall rate of KCS in women with above-average activity levels in their youth was lower by 86.42%, as compared with women who, in the past, were not physically active. In men, the analogous difference was 70.28%.

Even average physical activity levels in childhood and youth has a significant impact on the lower fear of movement as compared to those that were not physically active during the same period of life (respectively Biological Domain of 27.81% in women and 17.4% men, Psychological Domain 36, 26% of women and 26.92% men and 32.46% of KCS in women and 23.87% men). Such a distribution of results shows some regularities concerning the negative impact of reduced physical activity in the early stages of human development on self-estimation of the fear of movement in the later decades of life. Irrespective of gender, the greater impact of a passive lifestyle during one's youth on psychologically-conditioned barriers to physical activity in the older age is evident.

The results also revealed a different regularity. In the case of the Biological Domain of women that were physically inactive in youth, the largest share in this domain was that of the Power of Biological Drives (27.52%), with the Morphological one being the lowest (16.49%). In men, the greatest impact on the size of the Biological Domain was the Individual Need for Stimulation (29.66%), with the lowest, similarly to women, being the Morphological one (21.55%). It is possible that in the case of women, the high value of the Power of Biological Drives is conditioned by one of the causes of fear (i.e. ridicule movement due to lack of physical fitness).

On the basis of this one-off study, it is difficult to say to what extent the Power of Biological Drives is a modifiable variable, and to what extent it has already been programmed in one's youth by negative experiences related to the adoption of physical activity in youth. The open issue involves an open question why such fear would dominate in women. The lowest share of the influence of Morphological in shaping the domain of both sexes may indicate some kind of acceptance of excessive body weight and the resulting limitations in the elderly participants. However, in the case of the Psychological Domain, a distinctive system was registered for those that were physically active in youth.

Both women and men had Self-Assessment of Motor Predisposition (28.95% women and 30.21% men) as the largest share in this domain and Self-Acceptance as the lowest share (20.06% women and 19.75 % in men). Low assessment of the possibility of acquiring new skills seems quite logical for people who do not have past experience of a sporting nature. It may indicate an attitude of "it's not for me" when it comes to physical activity.

The smallest share of Self-acceptance in the development of this domain is, to some extent, compatible with the influence of the Morphological factor on the Biological Domain. To some extent, this indicates a kind of physical and mental acceptance of the fact of aging. It is difficult to assess at this time whether it is only the specificity of the Polish society, or of this part of Europe, among the culturally conditioned. In fact, it would require an expansion of the research to other Central European countries with similar historical circumstances, cultural and economic changes during the second half of the 20th century and the first decade of the 21st century.

Hank [25] indicates that the cultural and social contexts appear to be very important in successful aging. A sense of material, social and medical security may, to some extent, move motor skills in the field of movement and self-service to the second level. Whether or not it is a similar shift to the second level of the physical and mental perception of one's own body and the resulting barriers to physical activity we face in relation to the studied population is difficult to resolve. Participation of Morphological in the development of the Biological Domain and Self-acceptance domain in the shaping of the Psychological Domain allows for such speculation.

The problem of barriers to physical activity, including in the elderly, has already been tested. Cohen-Mansfield et al. [26] indicate a feeling of being sick and demonstrating poor performance as the main obstacles to practicing physical activity by older people. Fear of falling and of personal injury and low energy resources are other barriers to physical activity by older people [27]. Clark

[28] pointed to cultural and social factors as a source of barriers to physical activity among older people.

According to the multivariate analysis conducted by Meisner et al. [29] on a large population of people aged 60 years and more, hypokinesia is a factor that more strongly influences the functional limitations than did the incidence of chronic diseases. The problem of barriers to physical activity is analysed using a variety of methodological approaches. Tools used in this study were based on the treatment of activity barriers, such as kinesiophobia, which is a relatively constant psychological disposition, conditioned by the nature of both the biological and psychological factors [4]. Demonstrated in these studies, a significant association of kinesiophobia levels with physical activity levels in the distant decades of life in the elderly indicates that hypokinesia has not only a measurable impact on the current levels of physical fitness, but also affects the ratio of physical activity in the future. In other words, passive lifestyle in his youth encodes one to be burdened with a fear of movement attitude to physical activity in the older age.

The results obtained may have an important practical significance. It is supported by the studies that demonstrate the possibilities of preventive healthcare in the elderly by increasing physical activity [30]. It is possible that the resistance associated with participating in physical activity later in life may be associated with high levels of kinesiophobia programmed in the early stages of life. The results of this study which show that reduced physical activity in youth generates a high level of kinesiophobia in the later decades of life clearly point to that. With a certain degree of probability, one can also speculate about the negative effects of high levels of kinesiophobia on progress in the rehabilitation process of patients, and not necessarily only with musculoskeletal disorders. In this situation, it makes sense to specify one's own type of vulnerability profile to concerns related to participating in physical activity in the elderly. These vulnerabilities could be covered by preventive programmes or a process of rehabilitation. In light of the obtained results, in the assessment of the kinesiophobia conditioning in the elderly, one should determine the physical activity profile, also taking into account the activity level in the early decades of life.

CONCLUSION

The level of physical activity during childhood and adolescence among the inhabitants of southern Poland has a significant impact on the sense of the level of movement fear in the elderly. Past sports or lack thereof equally determine the level of kinesiophobia in men and women in the later decades of life. The occurrence of negative impacts of physical passivity during the development period on the level kinesiophobia in the elderly may have important practical implications in planning for the future of health prevention programmes.

REFERENCES

[1] Crombez G, Vlaeyen JWS, Heuts PHTG, Lysen R. Pain-related fear is more disabling than pain itself: evidence on the role of pain-related fear in chronic back pain disability. Pain. 1999;80:329-339.

[2] Hasenbring MI, Hallner D, Rusu AC. Fear-avoidance- and endurance-related responses to pain: development and validation of the Avoidance-Endurance Questionnaire (AEQ). Eur J Pain. 2009;13:620-628.

[3] Knapik A, Saulicz E, Gnat R. Kinesiophobia – introducing a new diagnostic tool. J Hum Kinetics. 2011;28:25-31.

[4] Knapik A, Saulicz E, Kuszewski M, Myśliwiec A, Rottermund J, Plinta R. Gender and level of kinesiophobia in adult population of southern Poland. Medical Journal of the Rzeszow University and the National Medicines Institute. 2012;10(3):277-287.

[5] Lundberg MKE, Styf J, Carlsson SG. A psychometric evaluation of the Tampa Scale for Kinesiophobia - from a physiotherapeutic perspective. Physiotherapy Theory and Practice. 2004;20:121-133.

[6] Roelofs J, van Breukelen G, Sluiter J, et al. Norming the Tampa Scale of Kinesiophobia across pain diagnoses and various countries. Pain. 2011;152:1090-1095.

[7] Burwinkle T, Robinson JP, Clark D. Fear of movement: factor structure of the Tampa Scale of Kinesiophobia in patients with fibromyalgia syndrome. J Pain. 2005;6(6):384-391.

[8] Cleland JA, Fritz JM, Childs JD. Psychometric properties of the fear-avoidance beliefs questionnaire and Tampa Scale of Kinesiophobia in patients with neck pain. Am J Physic Med Rehab. 2008;87(2):109-117.

[9] Hasenbring MI, Verbunt JA. Fear-avoidance and endurance-related responses to pain: new models of behavior and their consequences for clinical practice. Clin J Pain. 2010;26(9):747-753.

[10] Hasenbring MI, Hallner D, Klasen B, Streitlein-Böhme I, Willburger R, Rusche H. Pain-related avoidance versus endurance in primary care patients with subacute back pain: Psychological characteristics and outcome at a 6-month follow-up. Pain. 2012;153:211-217.

[11] Heuts PHTG, Vlaeyen JWS, Roelofs J, et al. Pain-related fear and daily functioning in patients with osteoarthritis. Pain. 2004;110:228-235.

[12] Houben RMA, Leeuw M, Vlaeyen JWS, Goubert L, Picavet HSJ. Fear of movement/injury in the general population: Factor structure and psychometric properties of an adapted version of the scale for kinesiophobia. J Behav Med. 2005;28(5):415-424.

[13] Karayanis N V, Smeets RJEM, van den Hoorn W, Hodges PW. Fear of movement is related to trunk stiffness in low back pain. PLoS ONE. 2013;8(6):e67779.

[14] Leeuw M, Goossens MEJB, Linton SJ, Crombez G, Boersma K, Vlaeyen JWS. The fear-avoidance model of musculoskeletal pain: current State of scientific evidence. J Behav Med. 2007;30:77-94.

[15] Pfingsten M. Angstvermeidungs-Überzeugungen bei Rückenschmerzen. Gütekriterien und prognostische Relevanz des FABQ. Schmerz. 2004;18:17-27.

[16] Roelofs J, Sluiter JK, Frings-Dresen MHW, et al. Fear of movement and (re)injury in chronic musculoskeletal pain: Evidence for an invariant two-factor model of the Tampa Scale for Kinesiophobia across pain and Dutch, Swedish, and Canadian samples. Pain. 2007;131:181-190.

[17] Kori SH, Miller RP, Todd DD. Kinesiophobia: A new view of chronic pain behavior. Pain Management. 1990;3:35-43.

[18] Chinn DJ, White M, Harland J, Drinkwater C, Raybould S. Barriers to physical activity and socioeconomic position: implications for health promotion. J Epidemiol Community Health. 1999;53:191-192.

[19] Brownson RC, Baker EA, Housemann RA, Brennan LK, Bacak SJ. Environmental and policy determinants of physical activity in the United States. Am J Public Health. 2001;91(12):1995-2003.

[20] Knapik A, Saulicz E, Rottermund J, Saulicz M, Myśliwiec A. Successful aging – the role of physical activity and its barriers in women of advanced age. In: Proceedings of the International Conference on Health Care Studies. Tomas Bata University in Zlin (Czech Republic); 2013, 13-22.

[21] Larsson C, Hansson EE, Sundquist K, Jacobsson U. Psychometric properties of the Tampa Scale of Kinesiophobia (TSK 11) among older people with chronic pain. Physiother Theory Pract. 2014;30(6):421-428.

[22] Quint S, Raich M, Luckman J. Evaluation einer zweidimensionalen Skala zur Erfassung von Angst -Vermeidungs-Überzeugungen in älterenPatienten mit chronischem Rückenschmerzen. Der Schmerz. 2011;25(3):315-321.

[23] Vincent HK, Seay AN, Montero C, Conrad BP, Hurley RW Vincent KR. Kinesiophobia and fear avoidance beliefs in overweight older adults with chronic low back pain, relationship to walking endurance: Part II. Am J Phys Med Rehab. 2013;92(5):439-445.

[24] Curtis J, Mc Teer W, White P. Exploring effect of school sport experiences on sport participation in later life. Sociol Sport J. 1999;16:348-365.

[25] Hank K. How "successful" do older Europeans age? J Gerontol Series B – Psychol Sci Social Sci. 2011;66B(2):230-236.

[26] Cohen-Mansfield J, Marx MS, Guralnik JM. Motivators and barriers to exercise in an older community-dwelling population. J Aging Phys Act. 2003;11:242-253.

[27] King AC, Castro C, Wilcox S, Eyler AA, Sallis JF, Brownson RC. Personal and environmental factors associated with physical inactivity among different racial-ethnic groups of U.S. middle-aged and older-aged women. Health Psychol. 2000;19:354-364.

[28] Clark DO: Identifying psychological, physiological, and environmental barriers and facilitators to exercise among older low income adults. J Clin Geropsychol. 1999;5:51-62.

[29] Meisner BA, Dogra S, Logan AJ, Baker J, Weir PL. Comparing the effects of physical inactivity on biopsychosocial components of successful aging. J Health Psychol. 2010;15(5):688-696.

[30] Berk DR, Hubert HB, Fries JF. Associations of changes in exercise level with subsequent disability among seniors: a 16-year longitudinal study. J Gerontol Series A – Biol Sci Med Sci. 2006;61(1):97-102.

APPENDIX

Kinesiophobia Causes Scale

Dear Madam/Dear Sir

You are kindly requested to choose ONE answer for EACH item below except items 8 and 13 where you will choose between yes/no/not sure for EACH answer

1. According to my body mass, I can claim that:

a) I control my body mass adjusting the level of motor activity [ ]

b) my body mass causes difficulties in performing several motor tasks, so I avoid them [ ]

c) due to overweight, I avoid physical efforts because of the risk of exhaustion or injury [ ]

2. I feel that because of its shape my body causes motor limitations in activities I would like to perform:

a) almost never [ ]

b) seldom [ ]

b) sometimes [ ]

d) often [ ]

e) very often [ ]

3. I think that in comparison with others I am always perceived as:

a) less active [ ]

b) less active than people of my age [ ]

c) equally active as people of my age [ ]

d) more active than other people [ ]

e) far more active than other people [ ]

4. Prolonged sitting:

a) feels pleasant to me, I can assume and maintain such position for a long time [ ]

b) similarly to other people, when it lasts too long, I have to change position [ ]

c) seems uncomfortable to me, I avoid prolonged sitting [ ]

5. When working, I try to find a way demanding the least physical effort because I do not like physical fatigue:

a) always [ ]

b) sometimes [ ]

c) never [ ]

6. I believe that activities demanding intensive physical effort:

a) are fatiguing to me and I try to avoid them if possible [ ]

b) are possible, it depends what specifically I should do [ ]

c) give me pleasure because physical fatigue means satisfaction to me [ ]

7. When I am physically exhausted:

a) I feel bad and it takes long time to recover [ ]

b) I recover as quickly as other people of my age [ ]

c) I recover quickly and I feel energy to start new actions [ ]

8. I believe that irrespectively of my present state of mind I could with NO rest:

	yes	not sure	no
a) march for 1 hour	[ ]	[ ]	[ ]
b) climb third floor	[ ]	[ ]	[ ]
c) ride a bike for 0.5 hour	[ ]	[ ]	[ ]

9. After work I usually feel:

a) tired, but after little rest I am ready to start activity (housework, visiting friends, going to the cinema, theatre, walking or sport) [ ]

b) tired, and I rest passively either lying or sitting [ ]

c) rather weary than tired, and I always rest for a long time either lying or sitting [ ]

10. Competition in sport, work, etc.:

a) always makes me satisfied and gives opportunity to win [ ]

b) is acceptable in disciplines I feel good at, there I like to compete [ ]

c) is out of question, I'm very sensitive to failures [ ]

11. I feel irritated when circumstances force me to park a car far from destination:

a) always [ ]

b) often [ ]

c) sometimes [ ]

d) infrequently [ ]

e) never [ ]

12. In relation to my own appearance:

a) I never felt embarrassed by the shape of my body. Wearing clothes exposing it (e.g. sport clothes or aswimsuit) do not seem problematic to meirrespective of what other people look like [ ]

b) I can wear a sports or bathing costume on condition that people around look similarly [ ]

c) I avoid situations in which clothing would expose shortcomings of my figure [ ]

13. I believe that activities mentioned below should, because of cultural reasons, match age and/or social status of a given person:

		yes	no
a) dancing		[ ]	[ ]
b) sport		[ ]	[ ]
c) fatiguing non-profit tasks	(e.g. housework, gardening, DIY)	[ ]	[ ]

14. On opportunity for participation in sport (holidays, encouragement from other people):

a) I always try to use it [ ]

b) I feel certain resistance, but usually I agree [ ]

c) first I watch others and try to judge my chances for good performance and then I take my decisions [ ]

d) it is very difficult to convince me, I rarely agree [ ]

e) no, this is not for me [ ]

15. In comparison with other people I believe that I can learn new movements (motor skills):

a) more quickly than others [ ]

b) more quickly than people of my age [ ]

c) as quickly as people of my age [ ]

d) more slowly than others [ ]

e) I cannot learn any motor skill [ ]

16. During my childhood and adolescence:

a) I did not participate in sport (only obligatory exercises) [ ]

b) I participated in sport as often as other kids [ ]

c) I was more active than others (e.g. training in a sport club) [ ]

17. Considering pain, traumas and injuries:

a) I believe that in life there is always a risk of sickness and injury, but this is not a factor reducing my motor activity [ ]

b) I believe that it is necessary to act in accordance to the 'common sense' and adjust the level and type of activity to individual age and ability [ ]

c) I believe that increased activity may be harmful, special care should be taken [ ]

18. When I fall sick or sustain an injury, I believe that:

a) first is to recover completely and then to start regular activity [ ]

b) a reasonable level of motor activity is necessary, in accordance to medical indications and my own condition [ ]

c) frequently the best way to fight the problem is to ignore the pain and lead normal, active life [ ]

19. In comparison with my relatives, friends and mates I:

a) rest more actively than they do [ ]

b) rest typically ofmy age and gender [ ]

c) rest more passively than they do [ ]

20. Expenses on active recreation are for me in comparison with other expenses:

a) less important [ ]

b) equally important [ ]

c) more important [ ]

Scoring questions:

Question number	Original response	Recorded value
1, 9, 10, 12, 17, 19	a) b) c)	0 50 100
2, 14, 15	a) b) c) d) e)	0 25 50 75 100
3, 11,	a) b) c) d) e)	100 75 50 25 0
4, 5, 6, 7, 16, 18, 20	a) b) c)	100 50 0
8a, 8b, 8c	yes not sure no	0 50 100
13a, 13b, 13c	yes no	100 0

Cite this article as:
Saulicz E, Knapik A, Saulicz M, et al. Physical activity in youth and level of kinesiophobia in older adults. Balt J Health Phys Act. 2016;8(2):64-77.