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PROFESSIONAL ARTICLES

INFLUENCE OF KINESIOPHOBIA ON ACTIVITIES OF DAILY LIVING OF ELDER INSTITUTIONALIZED PERSONS WITH CHRONIC PAIN

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SUMMARY

Aging of population leads to limitations in functional abilities and in activities of daily living (ADL) which are the essential elements of independent care of oneself. Limitations in performing these activities result in increasing need for assistance and institutionalizing of the elderly. The aim of this study was to investigate the influence of fear of movement, or kinesiophobia, on ADL in elder institutionalized people with chronic pain. The research included 60 individuals older than 65 suffering from chronic musculoskeletal pain, institutionalized in Gerontoloski Centar Nis. The participants` fear of movement was assesed by Tampa Scale of Kinesiophobia, performing ADL was assesed by Katz index and pain intensity was evaluated by Numerical Rating Scale. We found that a large number of participants had high degree of kinesiophobia (63%), as well as that there is statistically significant negative correlation between the values of Katz index and Tampa Scale ($r=-0.583$, $p<0.01$). There is no statistically significant negative correlation between the values of Numerical Rating Scale and Katz index ($r=0.139$, $p<0.289$). There is no statistically significant positive correlation between the values of Numerical Rating Scale and Tampa Scale ($r=0.215$, $p=0.098$). The research showed that kinesiophobia has influence on ADL in elder institutionalized people with chronic pain. Higher degree of fear of movement corresponds to greater dependence of the participants in performing ADL. Pain intensity influenced neither the fear of movement nor the dependence/independence in performing ADL.

Key words: kinesiophobia, activities of daily living, pain, the elderly

INTRODUCTION

Activities of daily living (ADL) are basic people`s everyday activities related to eating, dressing, bathing, toileting, continence and mobility. Furthermore, the activities of ADL are the essential elements of self-care and if even one of these activities can`t be independently performed, there is a need for supportive assistance. Limitation in performing ADL is an important factor in case of assessment of the indications for supportive services, starting with care and services of health care at home to admission to hospital or a nursery home [1]. The facts obtained by researching ADL can contribute to the improvement of quality of life of the elderly, either institutionalized or living in a community.

In the last few decades there is a tendency of aging population in both developed countries of the European Union and in Serbia and surrounding countries. It is estimated that the proportion of the elderly in relation to the total population will be greater in time and that the percentage of the elderly will increase from 17.4% to 28.6% till the middle of the century [2]. The aging brings to the decrease of functional capacity and in this way the performing of ADL becomes troublesome.

The ADL are influenced by a great variety of factors. Limitations in performing ADL are influenced by conditions such as dementia and conditions following the stroke, and diseases such as diabetes mellitus, osteoporosis and cardio pulmonary illnesses. [3, 4, 5, 6]. A reduced level of physical activities was found in individuals with chronic low back pain (CLBP) [7, 8, 9], in individuals with osteoarthritis (OA) and with other kinds of musculoskeletal pain being the consequence of long lasting diseases or musculoskeletal disorders [10, 11].

Elderly people with approximately similar pain intensity and living conditions can have different degrees of disability in the performance of ADL. That disability can partially be explained by avoiding the activities because of the fear of movement. This fear of movement was named kinesiophobia and defined as `an excessive, irrational and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or reinjury` [12]. Some researches emphasize the fear of movement pointing out that it is not only one of the important factors resulting in the avoidance of movement, but also the factor leading to disability even more than the pain itself [13,14,15].

Kinesiophobia or fear of movement brings to the avoidance of either movements or activities. It is consid-

ered that individuals find out that the avoidance of pain-provoking or pain-increasing situations reduces the probability of new painful experiences [14]. If this condition spreads over longer period of time, fear of movement can eventually lead to the decrease of functional abilities, as well as to different levels of disabilities [16].

Many studies researched kinesiophobia in patients with differently caused types of pain such as CLBP [7], OA [17], musculoskeletal pain [18], but we didn`t find any study that is related to investigating influence of kinesiophobia on ADL in institutionalized elderly people.

THE AIM

The present study was performed with the aim to establish the correlation of fear of movement with ADL in the elderly population with chronic pain who are institutionalized in a nursery home.

MATERIAL AND METHODS

This cross-sectional study included 60 participants, older than sixty-five, institutionalized in a nursing home Gerontoloski Centar Nis. All examined subjects had chronic musculokeletal pain resulting from different causes and with duration longer than six months. Out of 60 participants, 38 had chronic pain caused by hip or knee OA, 14 had chronic lumbal pain and 8 had chronic cervical pain.

The exclusion criteria were chronic pain caused by malignant diseases, inflammatory rheumatic diseases, cognitive disorders, conditions following the stroke, as well as severe cardio pulmonary disorders.

All participants self-reported their fear of movement, their performance of ADL and pain intensity. We used the following questionnaires: the Tampa Scale of Kinesiophobia (TSK) to assess fear of movement and the Katz Index of Independence in Activities of Daily Living to estimate the degree of independence of participants in performing ADL. Pain intensity was determined by the Numerical Rating Scale (NRS). Data obtaining was done during three months (from August to October 2014).

Kinesiophobia was measured using the Tampa Scale of Kinesiophobia (TSK) [12]. The TSK is a 17-item questionnaire aimed at the assessment of fear of movement. Each item is provided with a four-point Likert scale with scoring alternatives ranging from 1 - "strongly agree" to 4 - "strongly disagree". Participants were asked to mark their personal level of agreement or disagreement with each item of this scale. A total score is calculated after inversion of the individual scores of items 4, 8, 12 and 16. The score of this questionnaire ranges from 17 to 68 points. The higher the score, the greater the degree of fear of movement is, and according to Kori et al. and Vlaeyen et al. the cut-off is 37 and scores greater than this determine the high degree of kinesiophobia [12,16].

ADL were assessed using the Katz Index . The Katz assesses six daily living activities: bathing, dressing, toileting, mobility, continence, eating [1]. For all quoted activities the degree of dependence/independence is assessed. The responses were scored 0 (impossibility of independent performing of the particular activity) or 1 (independence in performing the particular activity). All responses were summed up to give a total ADL score from 6 (participant is independent in performing ADL) to 0 (showing the participant being very dependent in performing ADL).

The NRS (0-10) was used to measure the pain intensity. The participants were asked to rate the intensity of their pain on a scale of 0 (meaning no pain) to 10 (meaning worst possible pain). NRS classifies pain as mild (1-4), moderate (5-6), and severe (7-10) [19].

STATISTICAL DATA PROCESSING

Methods used for primary data analyses are the descriptive statistical methods, statistical hypotheses testing methods, interdependence examining methods. Central tendency measures (mean, median), variability measures (standard deviation) and relative numbers (structure indicators) were used concerning the descriptive statistical methods. A t-test for two independent samples and Mann-Whitney test were used concerning statistical hypotheses testing methods. Pearson coefficient of linear correlation and Spearman coefficient of rank correlation were used concerning interdependence analyses methods. Statistical hypotheses were tested on the level of statistical significance (alpha level) of 0.05 and 0.01. Software program IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL, USA) was used for statistical processing of the results.

RESULTS

The study included 60 participants, 70% of which were women. The distribution of participants by sex is shown in Table 1. The average age of the participants was 78.8. The average age of male participants was 81.8±7.7 and the average age of female participants was 77.6±6.2. The age of participants by sex is shown in Table 2 where we can notice that male participants are statistically significantly elder in relation to female participants ($t=2.244$, $p<0.05$).

Table 1. Distribution of participants according to sex

Sex	Number	%
Male	18	30.0
Female	42	70.0
Total	60	100.0

There is no statistically significant negative correlation between NRS and Katz index scores ($r= -0.139$, $p= 0.289$). Also, there is no statistically significant positive correlation between NRS and TSK scores ($r= 0.215$, $p= 0.098$). (Table 3.)

Table 2. - Age of participants according to sex

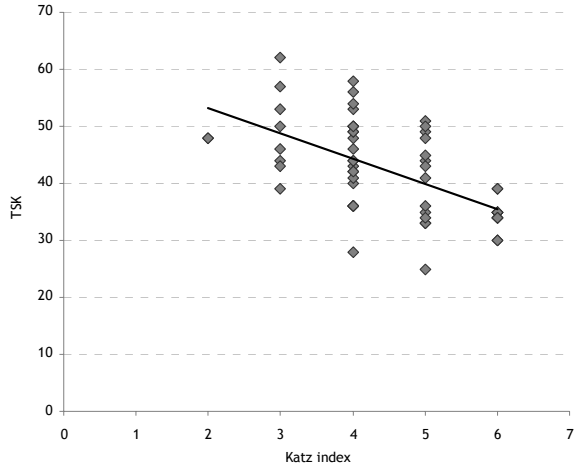
Sex	Number	Mean value	SD Age
Male	18	81.8	7.7
Female	42	77.6	6.2

There is a statistically significant medium negative correlation between the values of Katz index and TSK ($r= -0.583$, $p< 0.01$). That implies that lower degree of independence of participants in performing ADL corresponds to higher degree of fear of movement. (Graph 1).

Table 3. Correlation of TSK score, Katz Index and NRS

Scales	Correlation	Katz index	TSK
NRS	r	-0.139	0.215
	p	0.289	0.098
	n	60	60
Katz index	r		-0.583
	p		**<0.01***
	n		60

TSK: Tampa scale of kinesiophobia, which ranges from 17-68, with higher score indicating higher degree of fear of movement.
NRS: Numerical rating scale assessing pain intensity which ranges from 0 (no pain) to 10 (the worst possible pain).
Katz index: The Katz index of independence in activities of daily living, assessing the degree of dependence/independence in performing basic everyday activities, ranging from 0 to 6, where lower number indicates higher degree of dependence.



Graph 1. Correlation of TSK and Katz index scores

TSK: Tampa scale of kinesiophobia, which ranges from 17-68, with higher score indicating higher degree of fear of movement.
Katz index: The Katz index of independence in activities of daily living, assessing the degree of dependence/independence in performing basic everyday activities, ranging from 0 to 6, where lower number indicates higher degree of dependence.

Table 4. Scale scores according to the participants` sex

Scale	Sex		Significance
	Male	Female	
Number of participants n (%)	18 (30.0%)	42 (70.0%)	
NRS, median (Min-Max)	4.5 (2-8)	6.0 (1-8)	p= 0.111
Katz index $\bar{x} \pm SD$	4.4±1.1	4.5±1.1	p= 0.719
TSK $\bar{x} \pm SD$	39.8±7.2	43.3±8.5	p= 0.131

TSK: Tampa scale of kinesiophobia, which ranges from 17-68, with higher score indicating higher degree of fear of movement.
NRS: Numerical pain rating scale assessing pain intensity which ranges from 0 (no pain) to 10 (the worst possible pain).
Katz index: The Katz index of independence in activities of daily living, assessing the degree of dependence/independence in performing basic everyday activities, ranging from 0 to 6, where lower number indicates higher degree of dependence.

The NRS median value of male participants is 4.5 (range 2-8) and the median value of female participants is 6.0 (range 1-8). There is no statistically significant difference in terms of NRS scores between male and female participants (U = 280.5, p = 0.111). Mean Katz index value of male participants is 4.4±1.1, and of female participants is 4.5±1.1. Katz index average values do not differ statistically significantly in terms of sex (t=0.362, p=0.719). Mean TSK value of male participants is 39.8±7.2, and it is 43.3±8.5 for female participants. TSK average values do not differ statistically significantly in terms of sex (t=1.531, p=0.131). (Table 4.)

DISCUSION

The present study examined the influence of kinesiophobia on ADL of institutionalized elderly population with chronic pain. Based on three scales, we estimated the degree of kinesiophobia and pain intensity, as well as dependence/independence of the participants in performing ADL. We found that kinesiphobia is an important factor influencing the ADL and, consequently, the extent of the assistance needed for the performance of ADL. We also found that neither pain intensity nor the sex influence the degree of both kinesiophobia and dependence/independence in performing ADL.

An important problem with the elderly population is limitation in performing ADL including eating, bathing, dressing, toileting, continence and mobility. The assessment of ADL of institutionalized older people point to particular ADL in case of which the assistance is needed [20]. Limitation in ADL leads to greater dependence on assistance and it as often the reason for making the decision for institutionalizing of the elderly.

If we find out the causes of the limitations, and thus the causes of disabilities, we can take action with the aim of improving the individual`s independence in ADL, that is to say the quality of life. The improvement of quality of life is related to greater independence and to usage of the remaining functional abilities of the elderly living either in nursery homes or in a community. Elder people have different degrees of disability in performing the ADL regardless the similar health condition or pain intensity. Considering the importance of independence in ADL in elderly people, we examined the influence of kinesiophobia on performing ADL. In earlier researches it was found that kinesiophobia has influence on limitations of physical functioning in people with CLBP [9.13], and one research established that kinesiophobia influences the disability of elderly people living in a community [8]. We didn`t find any studies to investigate the occurrence of fear of movement and its impact on ADL of elderly population.

This research showed that kinesiophobia has influence on ADL of elderly institutionalized people with chronic pain. Also, this research showed that pain intensity influences neither the ADL nor the degree of kinesiophobia. Between the male and female participants there is no statistically significant difference considering the degree of kinesiophobia, pain intensity and ADL. Unlike these results, one study that investigated kinesiophobia in patients with chronic musculoskeletal pain had shown that men had higher degree of kinesiophobia compared with women [10].

A number of studies found that individuals with chronic musculoskeletal pain caused by degenerative changes (OA) can have fear of movement. [11,16,17,18] Some studies showed that fear of movement can be a predictor of disability in patients with acute and chronic low back pain, [9, 10] and in patients with OA [17] . Geisser et al. established that kinesiophobia and activity avoidance contribute to functional limitations in people with chronic pain [21].

High degree of fear of movement was found in more than a half of participants with musculoskeletal pain, 56% in the study Brändström et al. [10] and 60% in the study of Lundberg et al. [11] that is in line with our study results showing that high degree of fear of movement is present in 63% of participants. We didn`t find the correlation between the pain intensity and performing the ADL, that is in line with the conclusion of the research of Crombez et al. that pain influences the disability less than kinesiophobia [13]. On the contrary, Heuts et al. in their study underlined the importance of pain in daily functioning of OA patients, showing significant association of both pain intensity and kinesiophobia with the daily functioning [17].

The limitation of this study could be the selection of participants recruited in just one nursery home. Therefore, we cannot take into account the different ways of caring assistance and treatment of the elderly in other nursery homes. We assume that both the treatment and the ways of caring assistance could have the impact on fear of movement and activity avoidance that could be the subject of some future researches.

With aging population, there is growing need for assistance in ADL, thus we suggest that further researchers should pay attention to factors, such as kinesiophobia, which can have significant influence on ADL and, consequently, on the quality of life. In addition, further researches should find out how to reduce the fear of movement which, as it was found in our research, influences the ADL.

CONCLUSION

The results of our research indicate that kinesiophobia occurred in a considerable number of participants (more than a half) in this sample of elder institutionalized population with chronic pain. Higher degree of kinesiophobia was found in participants with higher degree of dependence in performing ADL. However, the pain intensity did not show any significant correlation with limitations in daily functioning.

On the basis of our research, we believe that kinesiophobia should be considered in elderly people with chronic pain because kinesiophobia can lead to limitations in performing everyday activities, as well as to greater degree of dependence on assistence.

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SRPSKI

UTICAJ KINEZIOFOBIJE NA AKTIVNOSTI DNEVNOG ŽIVOTA STARIH INSTITUCIONALIZOVANIH OSOBA SA HRONIČNIM BOLOM

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SAŽETAK
Sa starenjem stanovništva dolazi do ograničenja u funkcionalnim sposobnostima i u aktivnostima svakodnevnog života (ASŽ) koje su osnovni elementi samostalnog staranja o sebi. Ograničenja u izvođenju ovih aktivnosti dovode do potrebe za tuđom pomoći i za institucionalizovanjem starih lica. Cilj ove studije je bio da istraži uticaj straha od pokreta, ili kineziofobije, na ASŽ kod starih institucionalizovanih osoba sa hroničnim bolom. Istraživanjem je obuhvaćeno 60 osoba starijih od 65 godina, koje pate od hroničnog muskuloskeletnog bola, institucionalizovanih u Gerontološkom centru Niš. Strah od pokreta kod ispitanika procenjen je pomoću Tampa skale kineziofobije, obavljanje ASŽ procenjeno je Katz indeksom a intenzitet bola procenjen je Numeričkom skalom bola. Utvrđeno je da je veliki broj ispitanika imao visok nivo kineziofbije (63%). Takođe je utvrđeno da između vrednosti Katz indeksa I Tampa skale postoji statistički značajna negativna povezanost (r= -0,583, p< 0,01). Između vrednosti Numeričke skale bola i Katz indeksa ne postoji statistički značajna negativna povezanost (r=- 0,139, p= 0,289). Između vrednosti Numeričke skale bola i Tampa skale ne postoji statistički značajna pozitivna povezanost (r= 0,215, p= 0,098). Istraživanje je pokazalo da kineziofobija ima uticaja na ASŽ kod starijih institucionalizovanih osoba sa hroničnim bolom. Viši nivo straha od pokreta odgovara većoj zavisnosti ispitanika u obavljanju ASŽ. Intenzitet bola nije uticao na strah od pokreta niti na zavisnost/nezavisnost u obavljanju ASŽ.

Ključne reči: kineziofobija, aktivnosti svakodnevnog života, bol, stare osobe