

# Kinesiophobia and associated factors in elderly females with chronic musculoskeletal pain: pilot study

*Ocorrência de cinesiofobia e fatores associados em idosas com dor crônica musculoesquelética: um estudo piloto*

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## ABSTRACT

**BACKGROUND AND OBJECTIVES:** Fear of movement and re/injury (kinesiophobia) is factor associated to chronic pain and incapacity. Since elderly population is highly affected by chronic health problems followed by pain, especially musculoskeletal problems, it is important to understand the impact of pain-related fear on elderly females' health. This study aimed at determining the incidence of kinesiophobia in elderly females assisted in a geriatrics and gerontology ambulatory, as well as at investigating possible correlations with physical performance and other health and socio-demographic variables.

**METHODS:** This is a crossover exploratory study with non-probabilistic convenience sample of 30 elderly females, carried out with interviews, physical tests and medical charts review. Patients were evaluated for the presence of kinesiophobia, physical performance and other variables related to chronic musculoskeletal pain, in addition to socio-demographic information.

**RESULTS:** There has been kinesiophobia in 80% of the sample. There has been significant moderate correlation between physical performance and kinesiophobia ( $r=0.541$ ;  $p=0.002$ ). No other correlations were found.

**CONCLUSION:** Data have shown high incidence of kinesiophobia among evaluated elderly females, in addition to physical performance impairment associated to it.

**Keywords:** Chronic pain, Elderly females, Incapacity, Kinesiophobia, Performance.

## RESUMO

**JUSTIFICATIVA E OBJETIVOS:** O medo de movimento e reincidência de lesão (cinesiofobia) é um fator associado à dor crônica e incapacidade. Visto que a população idosa é altamente atingida por problemas crônicos de saúde acompanhados por dor, especialmente musculoesqueléticos, faz-se relevante a compreensão dos impactos do medo relacionado à dor sobre a saúde das idosas. O objetivo deste estudo foi determinar a ocorrência de cinesiofobia em idosas atendidas em um ambulatório geriátrico e gerontológico, bem como investigar possíveis correlações com desempenho físico e outras variáveis de saúde e sócio-demográficas.

**MÉTODOS:** Estudo transversal exploratório com amostra por conveniência não probabilística de 30 idosas, realizado por meio de entrevista, teste físico e revisão de prontuário. Foram avaliadas quanto à presença de cinesiofobia, ao desempenho físico e a outras variáveis relacionadas à saúde e à dor crônica musculoesquelética, além de informações sócio-demográficas.

**RESULTADOS:** A amostra estudada revelou ocorrência de cinesiofobia de 80%. Houve correlação significativa moderada entre desempenho físico e cinesiofobia ( $r=0.541$ ;  $p=0,002$ ). Não foram encontradas demais correlações.

**CONCLUSÃO:** Os dados revelam alta ocorrência de cinesiofobia nas idosas avaliadas e comprometimento do desempenho físico associado à mesma.

**Descritores:** Cinesiofobia, Desempenho, Dor crônica, Idosas, Incapacidade.

## INTRODUCTION

Population aging is a world phenomenon challenging health systems because it is associated to increased chronic diseases and functional limitations<sup>1</sup>, often followed by chronic pain<sup>2</sup>. In Brazil, there is high chronic pain prevalence among elderly females (51 to 67%), especially musculoskeletal pain (14 to 47%)<sup>2</sup>.

According to the International Association for the Study of Pain (IASP), pain is a disagreeable emotional sensation or experience, associated to real or potential tissue injury<sup>3</sup>, and chronic pain is pain without overt biological value, persisting beyond the expected time for tissue recovery, usually considered as three months<sup>4</sup>. Cognitive, affective, environmental and social factors influence pain persistence. A study has

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proposed a “cognitive model of fear of movement and injury recurrence”, where two extreme pain responses are expected: belief that movements and activities could worsen pain, thus avoiding them; and coping, associated to better outcomes<sup>5</sup>. The word kinesiophobia was then introduced to define “irrational, excessive and limiting fear of movement and physical activities, resulting from a sensation of vulnerability to possible physical injury”<sup>5</sup>. In the medium term, fear and avoidance of movement in anticipation to pain may bring physical (loss of mobility, strength and fitness and even disuse) and psychosocial (loss of self-esteem, depression, isolation) consequences<sup>6</sup>. Adequate pain evaluation, measurement and treatment processes should be adopted for elderly people, identifying possible factors associated to deterioration of their functional capacity and quality of life (QL)<sup>7</sup>.

So, this pilot study was carried out with 30 elderly females with chronic musculoskeletal pain assisted in a geriatric ambulatory of the city of Rio de Janeiro, to identify the prevalence of kinesiophobia among them and to evaluate possible correlations between physical performance and other health and socio-demographic variables.

## METHODS

This is a crossover, exploratory study with convenience non-probabilistic sample.

The study was made up of elderly females aged 60 years or above, under multidisciplinary health follow up in a geriatric ambulatory of a public university of the city of Rio de Janeiro, Brazil.

Patients were selected between October and December 2014, during general ambulatory working hours or in previously scheduled time for evaluation. So, 36 participants were obtained, being 33 females and 3 males. Male participants were excluded to maintain sample homogeneity.

Inclusion criteria were elderly females with musculoskeletal pain complaint, according to description of IASP’s document of the international year against musculoskeletal pain of 2009: “a number of disorders causing pain in bones, joints, muscles and adjacent structures” for three months or longer and with normal scores in the mental state mini-exam (MSME). Exclusion criteria were diagnosis or investigation of demential syndrome or mental diseases impairing understanding; severe uncorrected visual and/or auditory deficiency; physical incapacities preventing movement; chronic pain of other causes and recent surgeries.

Dependent variable of the study was kinesiophobia. Independent quantitative variables were: number of body regions affected by pain, pain intensity, number of comorbidities (physical), education level, age, number of falls in the last year and physical performance (test result in seconds). Marital status, region with more severe pain intensity, depression and physiotherapy were independent qualitative variables.

Socio-demographic characteristics were represented by the variables: age, education level and marital status. The number of comorbidities and falls in the last year and depression were health status variables. As to pain, number of painful regions

and most painful region, pain intensity and physiotherapy were obtained.

Fear of movement and injury recurrence was evaluated by means of the Brazilian version of the Tampa Scale for Kinesiophobia (TSK). This is a questionnaire with 17 statements scored 1 to 4. Total score is calculated after inversion of items 4, 8, 12 and 16, and varies between 17 and 68 points. The highest total score, the highest the level of kinesiophobia<sup>5</sup>. A total of 37 points or less suggests low levels of kinesiophobia, while scores above 37 suggest high levels of kinesiophobia<sup>6,8</sup>. As described in the Brazilian version of the scale, statements were read and, when necessary, explained to participants<sup>5</sup>. It is widely used to measure kinesiophobia, with high internal consistence and adequate test-retest reliability<sup>5</sup>.

Physical performance was evaluated by the “Timed Up and Go” (TUG) test. Elderly patients shall start from the initial position with back supported on the back of the chair, stand up, walk 3 meters, turn, return and sit again. Timing starts with the starting command and ends when participants return to initial test position. Performance of up to 12 seconds may be considered normal for the elderly community; above 20 seconds it suggests major physical mobility deficits and risk of falls<sup>9</sup>.

For participants’ cognitive screening, MSME was used, which is a tool made up of questions grouped in 7 cognitive function categories and total score of zero to 30 points, widely used for cognitive evaluation. In Brazil cutoff points were established according to education level: 19-20 for illiterate and 23-24 for individuals with one or more years of study<sup>10</sup>. Those with scores below cutoff point were excluded from the study to prevent problems with scales understanding.

Body map for pain location was used to establish the number of regions affected by pain for more than three months. Among sites, elderly females were asked to identify that with highest pain intensity (worst pain site) according to the 11-point numeric visual scale (NVS). Zero means no pain and 10 the worst possible pain. This scale is reliable to measure pain in the elderly population<sup>7</sup>.

Number of falls in the last 12 months was obtained by self-report, considering them “unexpected event where subjects are positioned on the ground or a level inferior to his”<sup>11</sup>. Participants were also asked about being under physiotherapeutic treatment for pain relief. Number of comorbidities, marital status and education level were obtained during the interview and/or by medical charts review. Depression was confirmed by clinical charts report made by geriatricians and/or psychologists of the ambulatory team.

## Statistical analysis

Analysis for proportion estimate was used for sample calculation, which takes into consideration the prevalence of the event in the study, relative precision of 5% and significance level of 5%. So, sample size was calculated in 384. Prevalence of kinesiophobia was calculated considering scores above 37 in the TSK.

Variables marital status and worst pain site were regrouped in dichotomies: stable union or not stable union (including

widows) and trunk or not trunk, respectively for the bivariate analysis.

Data distribution normality was evaluated by Shapiro-Wilk test. Quantitative variable kinesiophobia, number of comorbidities and age have followed normality patters, in addition to all qualitative variables. Pearson correlation coefficient was used to check quantitative variables with normal distribution and Spearman test for those not meeting normality criteria. Student *t* test for independent samples was used to evaluate differences between quantitative and qualitative variables means. Significance level of 0.05 was considered for all statistical analyses.

All participants have signed the Free and Informed Consent Term (FICT).

This study was approved by the Research Ethics Committee, Hospital Universitário Pedro Ernesto/UERJ under research protocol 32966914.7.0000.5259, in August 20, 2014.

### RESULTS

Three elderly females were excluded by MSME, so sample was made up of 30 female participants with mean age of 79.4±7.03 years. As to marital status, there has been predominance of widows (60%). Mean education level was approximately 8 years. Number of comorbidities has varied from 1 to 7. Number of falls has varied from none to 14 episodes, with mean of 1.2 episode in the last year.

Elderly patients had chronic musculoskeletal pain in 1 to 12

body regions according to the pain location body map. Among them, lumbar spine was the site with the highest pain intensity in 40% of participants. Mean pain intensity was 8. As to depression, 9 elderly females (30%) had depression diagnosed in medical charts. At evaluation moment, 22 (73.3%) were not under physiotherapeutic treatment. Qualitative variables frequency and quantitative variables descriptive analysis are shown in tables 1 and 2, respectively.

TSK scores varied from 29 to 62 points, with mean of 45.8±8.9 points. Twenty-four participants had more than 37 TSK points and only 6 had 37 or less points. So, incidence of kinesiophobia in the group was 80%.

Group had regular TUG test performance of 15.2±4.5 seconds, varying from 9.96 to 28 seconds for its execution.

There has been moderate positive and statistically significant correlation between kinesiophobia and TUG test result ( $r=.541$ ;  $p=0002$ ). Figure 1 illustrates this correlation. There has been no significant correlation with remaining variables. There has been no significant difference in qualitative variables means ( $p>0.05$ ).

**Table 1.** Qualitative variables frequency. Rio de Janeiro - RJ, 2014-2015

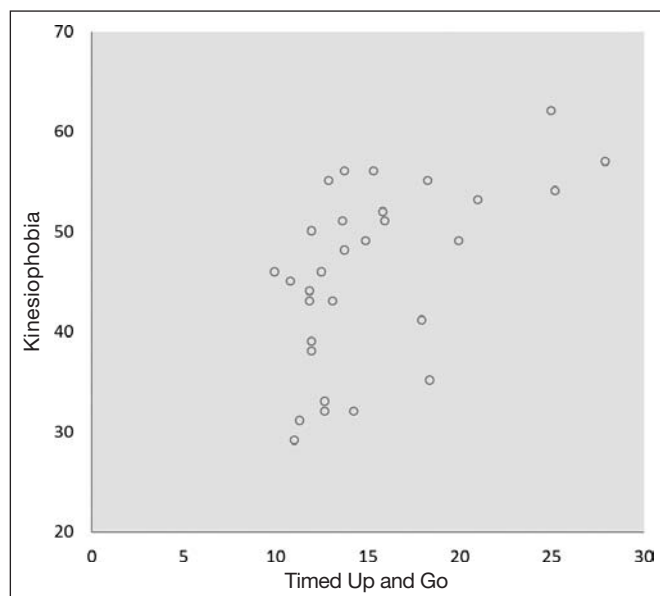
Variables	Frequency	Percentage
Marital status	n°	%
Married	5	16.7
Single	2	6.7
Divorced/separated	5	16.7
Widow	18	60.0
Total	30	100.0
Depression		
Yes	9	30
No	21	70
Total	30	100.0
Worst pain site		
Cervical spine	2	6.7
Lumbar spine	12	40.0
Thoracic spine	1	3.3
UULL	4	13.3
LLII	11	36.7
Total	30	100.0
Physiotherapy		
Yes	8	26.7
No	22	73.3
Total	30	100.0

UULL = upper limbs; LLII = lower limbs.

**Table 2.** Descriptive analysis of quantitative variables n=30). Rio de Janeiro - RJ, 2014-2015

Variables	Minimum	Maximum	Mean	SD
TSK	29.0	62.0	45.833	8.967
Age	65.00	92.00	79.400	7.039
TUG	9.96	28.00	15.286	4.592
Education level	0	16.0	8.167	5.052
Number of comorbidities	1.0	7.0	3.333	1.667
Falls	.0	14.0	1.233	3.059
NVS	2.0	10.0	8.000	2.334
Pain sites	1.0	12.0	3.700	2.781

TSK = Tampa scale for kinesiophobia; TUG = timed up and go; NVS = numeric visual scale.



**Figure 1.** Correlation between kinesiophobia and timed up and go test. Rio de Janeiro, RJ, 2014-2015

## DISCUSSION

This study has included 30 elderly females with chronic musculoskeletal pain and has observed high kinesiophobia levels in 80% of them. Fear of movement and injury recurrence are considered predictors of chronic pain and incapacity. Disuse, incapacity and depressive symptoms are morbidities associated to this behavior<sup>5,12,13</sup>. The high incidence of kinesiophobia found in this study stresses the importance of studying this phenomenon, especially in the elderly population, which is more subject to losses related to pain and fear of movement. There are evidences that pain-induced incapacity increases with age and is associated to higher risk of falls and fragility<sup>14</sup>.

Studies on pain, kinesiophobia and other associated factors tend to exclude subjects above 65 years of age. So, a group broadly affected by chronic pain associated to musculoskeletal disorders<sup>7</sup> remains poorly studied.

Chronic pain is seen as worsening factor for physical performance<sup>14</sup> and fear of movement is associated to incapacity, with decreased muscle strength and mobility, in addition to worse physical tests results<sup>5</sup>. Confirming such evidences, our study has found moderate however significant correlation between kinesiophobia and physical performance. This result suggests that the worse is kinesiophobia, the worse is the physical performance of elderly females with chronic pain. However, this should be interpreted with care, due to the possibility of changes associated to aging having also influenced test performance. Mean pain intensity among participants was 8 points, considered severe according NVS, however there has been no significant correlation with TSK scores. Other authors have also not found significant correlation between pain intensity and level of kinesiophobia<sup>5,12</sup>.

In the study by Dellarozza et al.<sup>2</sup>, 25.4% of interviewed elderly females have reported more severe pain in the lumbar region, followed by 21.9% in lower limbs. The same pattern was observed in our study, where 40% have mentioned lumbar region as the worst pain site, followed by LLLI by 36.7%.

The reaction of avoiding physical and even social activities in anticipation to pain is associated to depression<sup>5,6,12,13</sup>, which has already been correlated to higher TSK scores<sup>12</sup>. However, there has been no significant difference between depression and TKS scores in our study.

With regard to falls in the last 12 months, there has been broad variation in the number of reported episodes, however mean was 1.2 fall per year. Pain and fear have been observed as factors impairing physical performance, leading to increased risk of falls in elderly reporting pain or pain-induced incapacity<sup>14</sup>. TSK was tested in several languages, including Portuguese<sup>5</sup>, and in different musculoskeletal disorders and good construct validity was found<sup>12</sup>. However, there are different versions with possibility of excluding items with reversed scores, and there is still no established cutoff point<sup>12</sup>. So, its use in research and

in the clinic is difficult. Currently, the scale has transcultural adaptation to Brazil (TSK – Brasil)<sup>5</sup>, but has still not been validated. It shows high internal items consistence and adequate test-retest reliability, but there are items which may impair construct validity<sup>5</sup>. Cutoff point used in our study is not validated in Brazil and this might be a limitation of the study.

There are no evidences of the evaluation of the scale for use in populations above 65 years of age. So, it is important that TSK be further structured to establish the adequate version to be used, a possible cutoff point to divide subjects in groups of kinesiophobia intensity, in addition to its study with the elderly. It is believed that more significant results may be obtained using total “n” obtained by sample calculation.

## CONCLUSION

Our study has shown high incidence of kinesiophobia among evaluated elderly females. There has been statistically significant correlation between kinesiophobia and gait velocity test, suggesting that physical performance of participants would be impaired by fear of movement.

Further studies are needed to better understand fear of movement and its consequences in the elderly, in addition to establishing standards for the use of available tools for its evaluation.

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