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Original Article

How Does Pain Localization Affect Physical Functioning, Emotional Status and Independency in Older Adults with Chronic Musculoskeletal Pain?

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Abstract. [Purpose] The aim of this study was to show the impact of chronic musculoskeletal pain of the spinal column and lower extremities on physical functioning, emotional status, and independency in older adults. [Subjects] In this cross-sectional study, 258 older adults (mean age, 71.98±5.86 years, 50.8% males, 49.2% females) living in their own residences were evaluated. [Methods] Pain intensity was analyzed using a visual analogue scale. Physical functioning was evaluated with the Timed Up and Go Test (TUG) and a Six-Minute Walk Test. The Geriatric Depression Scale was used to determine emotional status. The independency in daily living of the participants was evaluated using the Lawton Brody IADL Scale. All participants were divided into two groups in accordance with the pain localization: the (1) spinal pain and (2) lower extremity pain groups. [Results] When the pain scores were compared, no significant differences between the two groups were found. The same results were found in terms of TUG scores. The spinal pain group had higher scores in terms of aerobic capacity than the lower extremity pain group. [Conclusion] The results indicate that chronic musculoskeletal pain in the lower extremities decreased aerobic capacity much more than spinal pain in older adults.
Key words: Older adults, Musculoskeletal pain, Physical functioning

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INTRODUCTION

Musculoskeletal pain is a common problem among older adults. The longitudinal effects of musculoskeletal pain are well known. Moreover, restrictions of physical functioning among older adults are very important[1, 2)]. Spinal pain is the most common of all chronic pain disorders. In a previous study, 24.6% of older adults with chronic pain reported back pain[3)]. Including back and neck pain, spinal pain negatively affects mobility and aerobic capacity of the elderly. Chronic diseases and pain in aging can also saliently affect the balance ability of older adults[4)]. Physical functioning including balance ability and aerobic capacity is important for the activities of daily living and static and dynamic posture. Chronic diseases and aging may affect physical functioning[5, 6)]. Musculoskeletal disorders may occur due to many reasons that affect sensorial and motor control systems and may affect functional capacity negatively. With aging, musculoskeletal capacity is reduced, which results in loss of muscle mass and strength. A decrease in aerobic capacity and physical activity levels can cause changes in gait and balance[7, 8)]. In addition, chronic musculoskeletal pain negatively affects emotional status and activities of daily living (ADL)[9, 10)].

The aim of this study was to show the impact of chronic musculoskeletal pain of the spinal column and lower extremities on physical functioning, emotional status, and independency in older adults.

SUBJECTS AND METHODS

The study sample consisted of two hundred and fifty-eight independent older adults who were randomly selected from volunteers. They were between sixty-five and one hundred years of age. All were living in their own homes with their family members or alone.

The exclusion criteria were
- being bedridden,
- being dependent in daily living activities,
- having a cognitive impairment,
- having a neurological diseases such as stroke, Parkinson disease, multiple sclerosis or spinal cord injuries.

The study was approved by the Ethics Committee for Non-invasive Clinical Research of Pamukkale University Denizli, Turkey (2012/16-03). All participants gave written informed consent to participate in this study.

Sociodemographic data including age, gender, marital status, and education level were recorded through a face to face interview with a physiotherapist. Drug usage was also

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recorded. Body Mass Index (BMI) was calculated for each older adults to define their obesity level.

The pain intensity was measured using the visual analog scale (VAS).

We asked the older adults who reported musculoskeletal pain to indicate the localization on their pain on a body diagram. Only the older adults who reported spinal or lower extremity pain were included in this study (n=212; 82.1%). The lower extremity pain was not related to spinal structures.

The Six-Minute Walk Test (6MWT) was used to evaluate aerobic capacity. The 6MWT was performed in a 30-m-long corridor, and the participants were instructed to walk as fast as possible without running. They could stop walking if they felt any discomfort, fatigue, or shortness of breath. Each participant was tested individually and was constantly observed by a physiotherapist.

The Timed Up and Go (TUG) test was used to evaluate dynamic balance. The TUG test as described by Podsiadlo and Richardson is a simple timed test used to qualify functional mobility[11]. In the TUG test, participants were asked to stand up from a standard chair with a seat height of between 40 and 50 cm, walk a 3-m distance at a normal pace, turn, walk back to the chair, and sit down. The time was measured in seconds, and timing began at the word "go" and ended when the participant's back touched the backrest of the chair, with a shorter time indicating better balance ability[12].

The Yesavage Geriatric Depression Scale (GDS) was used to detect depressive symptoms in order to describe emotional status. This scale was developed as a self-report measure for depression in older adults. Users respond in a "Yes/No" format. The GDS was originally developed as a 30-item instrument. Since this version proved both time-consuming and difficult for some patients to complete, a 15-item version was developed. The sensitivity and specificity of the GDS-15 have been assessed in a general elderly population[13]. We used the 15-item short-form GDS. The Turkish internal validity of the GDS was confirmed by Aktürk et al[14]. For the 15-item short form GDS, 0–4 points is normal, 5–9 points indicates mild depression, and 10–15 points indicates more severe depression. The cutoff this scale is six.

The Lawton-Brody Instrumental Activities of Daily Living Scale (IADL) was used to evaluate independency in daily living activities. The IADL scale measures complex functional activities of ability including using a telephone, handling finances, self-administration medication, use of transportation, shopping, housekeeping, laundry, and cooking. One point was awarded if a patient required little/no help in performing a task, and no points were awarded if significant/total help was required. For the Lawton-Brody IADL, 0–8 points is evaluated as dependent, 9–16 points is evaluated as semi-dependant, and 17–24 points is evaluated as independent. The maximum score is 24 points.

Statistical analysis

The data were analyzed using the Statistical Package for Social Science (SPSS, Chicago, IL, USA) version 16.0 software for Windows. To evaluate sociodemographic variables, descriptive statistical methods were used [mean ± standard deviation (SD) and frequencies (count and percentage)]. To compare the two groups, the independent samples t-test was used. The level of statistical significance was set at 5% ($p \leq 0.05$).

Table 1. Baseline characteristics of participants with spinal and lower extremity pain

	Spinal Pain (Group I)		Lower Ext. Pain (Group II)	
	N (%)	Mean (SD)	N (%)	Mean (SD)
Total	130 (100)		82 (100)	
Gender				
Male	63 (48.4)		41 (31.5)	
Female	67 (51.5)		41 (31.5)	
BMI score*		27.45 (3.95)		28.14 (4.35)
Marital status				
Single	41 (31.5)		33 (40.2)	
Married	89 (68.4)		49 (59.7)	
Chronic illness				
No	16 (12.3)		6 (7.3)	
Yes	114 (87.6)		76 (92.6)	

Body Mass Index (BMI, kilograms per square meter) ≥30, SD: standard deviation, *Significant

Table 2. Comparison of the variables of the groups

	Spinal Pain (Group I) (n=130) Mean (SD)	Lower Ext. Pain (Group II) (n=82) Mean (SD)	
VAS (cm)	5.06 (1.89)	5.44 (2.24)	
TUG (sn)	24.37 (16.49)	24.24 (11.31)	
6MWT (m)	363.73 (278.66)	284.17 (195.78)	**
GDS-score	6.04 (3.63)	7.12 (4.01)	**
IADL-score	9.20 (4.99)	10.76 (5.68)	**

*The independent samples t-test was used. SD, standard deviation; VAS, visuel analog scale; TUG: Timed Up and Go Test; GDS, Geriatric Depression Scale; IADL, Instrumented Activities of Daily Living. **Significant

RESULTS

Table 1 shows the baseline data of the groups. Musculoskeletal pain was reported by 212 participants (82.1%). Spinal pain was reported by 61.3% of the participants (neck and lower back; n=130), and 38.7% reported pain in the lower extremities (n=82). The mean age of the participants was 71.98 ± 5.86 years; 131 (50.4%) were male, and 127 (48.8%) female. The mean VAS score during activities was 5.06±1.89 cm for group I and 5.44± 2.24 cm for group II. No differences between the two groups in terms of the VAS score were found ($p>0.05$) (Table 2).

Table 2 also shows the TUG, 6MWT, GDS, and IADL results. Except for the TUG scores, all outcome measurements showed significant differences between the groups.

Table 3. The partial correlation coeffidents in the spinal pain (group I) (after correcting for age and gender)

Control Variables Age and Gender		1	2	3
1-	6MWT	−		
2-	GDS	−0.090	−	
3-	IADL	0.142	−0.312*	−

6MWT, 6 Minute Walk Test; GDS, Geriatric Depression Scale; IADL, Instrumental Activities of Daily Living; *Significant

Table 4. The partial correlation coeffidents in the lower extremity pain (group II) (after correcting for age and gender)

Control Variables Age and Gender		1	2	3
1-	6MWT	−		
2-	GDS	−0.088	−	
3-	IADL	−0.025	−0.420*	−

6MWT, 6 Minute Walk Test; GDS, Geriatric Depression Scale; IADL, Instrumental Activities of Daily Living; *Significant

Namely, the participants in group II (with lower limb pain) had a lower score in terms of aerobic capacity than those in group I (p=0.027). Although the two groups had scores below the cutoff point for the GDS, group II had a higher score than group I (p=0.045). Both groups I and II had mild depression. The two groups had more or less the same scores in terms of the IADL (p=0.036). So, all participants in both groups were semi-dependent according to the IADL scores. Tables 3 and 4 show that there were significant inverse correlations between the GDS and IADL scores.

DISCUSSION

Musculoskeletal pain is a common health problem among older adults. In this study, the results supported the related literature. Most of the older adults this study complained of musculoskeletal pain in their spinal column and lower extremity.

The same complaints can also be found in the literature. Moreover, Helme and Gibson, Dawson et al., and Robin et al. reported that lower extremity pain including hip, knee, and foot pain are very common[15–17]. In our study, we studied 258 older adults who reported musculoskeletal pain in their spinal column and lower extremities (n=212; 82.1%).

In this descriptive and comparative study, we focused on musculoskeletal pain by comparing the localization. The results showed that lower extremity pain affected functioning, especially physical functioning, in older adults more than spinal pain. In addition to this, the results obtained from the 6MWT also showed that the older adults with lower extremity pain had the worst aerobic capacity compared with those with spinal pain. That is, our results showed that chronic musculoskeletal pain in the lower extremity led to a decreased aerobic capacity[18–23].

On the other hand, the older adults evaluated in this study showed decreased independency in daily living activities. But they were not fully dependent. The same results can be found in the literature[24, 25].

Since depressive symptoms are common during aging, we also detected depressive symptoms in our study. But our sample had mild depressive symptoms according to the GDS. Although there have been some finding indicating that chronic musculoskeletal pain increases depressive symptoms in older adults, our results did not support this idea[26, 27].

The results obtained in this study also supported the inverse relation between depressive symptoms and independency in daily living activities. This show that increased depressive symptoms led to decreased independency in daily living activities. This is not an unexpected result, as it has been reported in previous related literature[9, 25, 26].

The limitations of this study are as follows:

(1) The sample size was too small to make a general comment.

(2) We studied older adults with spinal or lower extremity pain, but we could not compare our sample with older adults without pain.

Despite to the limitations mentioned above, the study has a major strength: this study is the first one showing the effects of pain localization in older adults completed in Turkey.

Keeping in mind the limitations of the present study, we plan to perform further research with a larger sample size so we will be able to make general comments with regard to this field.

In conclusion, the results of this study indicate that evaluation and relief of chronic musculoskeletal pain are vital in geriatric rehabilitation programs. For this reason, health providers, including physiotherapists, ergotherapists, medical doctors, and nurses, should consider chronic musculoskeletal pain in older adults. In particular, physiotherapists and ergotherapists should focus on chronic lower extremity pain to improve physical functioning and aerobic capacity of older adults to make them more mobile and improve their aerobic capacity.

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