

## The effect of a home exercise program prescribed by physiotherapists for pain relief

Home training program and its effects on pain

Muhammed Arca<sup>1</sup>, Elif Dilara Durmaz<sup>1</sup>, Omer Satıcı<sup>2</sup>, Ayse Ferdane Oguzoncul<sup>3</sup>

<sup>1</sup>Physical therapy and rehabilitation, Saglik Bilimleri University, Diyarbakir Gazi Yasargil Training and Research Hospital, Diyarbakir

<sup>2</sup>Department of Biostatistics, Dicle University, Medical Faculty, Diyarbakir

<sup>3</sup>Department of Public Health, Firat University, Medical Faculty, Elazig, Turkey

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### Abstract

**Aim:** The aim of this study was to evaluate the effect of the home exercise program on the pain of physiotherapy and rehabilitation outpatients.

**Material and Method:** The study included 316 patients with low back, neck, shoulder, and knee pain aged 18-65 years. A personal information form was filled out to obtain demographic information about these patients. After exercise training given by the physiotherapists, the pain of the patients was evaluated by a visual analog scale (VAS). After 4 weeks, the patients were called by telephone and questioned whether they were doing the exercises and their pain severity. **Results:** Among patients, 54,4% (172) were female; 72,8% of the patients with a mean age of 39.85±13.77 years were married, 40,8% were primary school graduates and 37,3% were housewives. One hundred three patients applied (32,6%) with neck pain, 132 (41,8%) with low back pain, 29 (9,2%) with shoulder pain and 52 (16,5%) with knee pain. It was observed that 55,4% (175) of the patients who were prescribed training did not perform their exercises. Among patients who exercised, 69,6% did not use analgesics in this process. A statistically significant result was found when the before and after exercise VAS data of participants who did exercise and those who did not were compared ( $p=0.001$ ).

**Discussion:** In the study by Kiliç, more than half of the patients who exercised benefited from the exercises they performed and stated that the exercise decreased problems such as pain, locking, fatigue, and limitation of movement due to disease. It was determined that the patients who completed the exercise program had less pain. Regular exercise programs will lead to positive outcomes.

### Keywords

Pain; Low back; Neck; Exercise

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Corresponding Author: Ayse Ferdane Oguzoncul, Department of Public Health, Firat University, Medical Faculty, Elazig, Turkey.

E-mail: aferdane@gmail.com GSM: +90 5324839830 P: 0090424 2370000-4685

Corresponding Author ORCID ID: <https://orcid.org/0000-0002-9820-9720>

## Introduction

Musculoskeletal system diseases (MSD) are an important health problem that negatively affects the quality of life and constitutes a serious burden on health expenditures [1]. It is defined as an important public health problem because it is affected by socioeconomic, demographic, and psychosocial factors [2].

The incidence of musculoskeletal problems in the world is reported to be 9,1% in the low back region, 4,8% in the neck region, 3,6% in the knee region, and 8,1% in other regions [3]. According to 2016 data, the rate in Turkey is reported to be higher than the rate in the world. It was found that low back problems accounted for 27,1% and neck problems made up 18,1% [Türkiye Sağlık Araştırması (Turkey Health Survey), 2016]. Patients, families, and society try many ways to get rid of the pain. Pharmacological methods are often used to control pain in patients. Analgesic treatment in pain control is the most preferred treatment method because it can be applied easily and affects quickly. However, the unconscious and intense use of analgesics is detrimental to the individual and national economies and has a negative effect on some physiological functions [4].

Active exercise-based treatment approaches are known to be effective in pain relief and functional recovery [5]. Nowadays, dynamic programs that require the active participation of the patient, which are aimed at improving the body flexibility, muscle strength, and functional capacity to reduce pain are recommended. These programs are called home exercise programs and are provided to support appropriate patient groups [6]. The aim of this study was to evaluate the effectiveness of exercise training prescribed to patients with musculoskeletal problems who were sent to the physiotherapy rooms for physical therapy and rehabilitation in an outpatient clinic.

## Material and Methods

This study was conducted as an uncontrolled experimental study. This study was carried out in accordance with the rules set out in the Declaration of Helsinki (23.06.2017) after obtaining approval and chief physician approval from Dicle University Clinical Research Ethics Committee (23.06.2017, 131). The study was carried out the Training and Research Hospital Physiotherapy and Rehabilitation Unit between July 1 and September 29, 2017.

Three hundred fifty musculoskeletal patients with neck, low back, shoulder and knee pain were informed about the study. Three hundred sixteen patients who accepted the study were enrolled in exercise training after signing informed consent form. Patients with pain in low back, neck, and knee, who had no problem of perception and response, between the ages of 18-65, who were referred to the physiotherapy clinic for exercise training were included in the study. People who did not want to participate voluntarily and who had cancer pain, neuropathic pain and diagnosed rheumatic disease were excluded from the study.

All patients who came to the physiotherapy room for 3 months were interviewed and the patients who accepted to participate in the study completed their personal information form for

their demographic information and a 4-week exercise program was given. At the end of 4 weeks, the patients were called by telephone and questioned about their pain and whether they had exercised.

After exercise training, the visual analog scale (VAS), which is the most commonly used method for evaluating the effects of the exercises on pain severity, was used. The VAS used to assess pain is a scale of 0-10. A value of 0 corresponds to no pain and a value of 10 corresponds to very severe pain. The patient gives a value indicating the severity of pain.

Exercise programs consist of stretching, mobility, strengthening, and flexibility exercises for low back, neck, shoulder, and knee. A maximum of 5 exercises was given to each patient. The exercises are described as 10 actions 3 times a day for the first 15 days and 20 actions for the next 15 days. A leaflet with pictures of all the exercises was given, and the patients were called by phone after 4 weeks and their evaluations were made.

### Types of exercise

**Neck Exercises:** It consists of active normal joint movements performed with neck flexion, right/left rotation, extension, right/left lateral flexion, and shoulder circulation [7].

**Waist Exercises:** McKenzie Extension Exercises (trunk extension, flexion and lateral displacements) and combined exercises consisting of Williams Flexion Exercises (trunk flexion, posterior pelvic tilt, lumbar extensor stretching) have been used [8].

**Shoulder Exercises:** Codman Pendulum Exercises (shaking movements by loosening the arm with its own weight) and Wand Exercises (front, side, out, back and inward movements with the help of a lath between hands) [9].

**Knee Exercises:** It consists of active normal joint movements performed with hip and knee flexion, straight leg lifting, terminal extension and squatting exercises [10].

SPSS 21.0 packaged software was used on the computer for coding and statistical analysis of the data. The Chi-square and T-tests as significance test and minimum, maximum, mean, standard deviation, percentage values were used for the data analysis. Then we used the GLM / Multivariate method for further analysis. The significance level was accepted as  $p < 0.05$ .

## Results

Among patients, 45,6% were male ( $n=144$ ), 72,8% were married, 40,8% were primary school graduates and 37,3% were housewives (Table 1). The mean age of the patients was  $39.85 \pm 13.77$  (min = 17, max = 65) years.

Primary body regions in pain were low back ( $n=132$ ) 41,8%, neck ( $n=103$ ) 32,6%, knee ( $n=52$ ) 16,5% and shoulder ( $n=29$ ) 9,2%; 25,6% ( $n=81$ ) of the patients had pain starting 2-6 months ago; 77,8% of them did not receive physical therapy or did not exercise at all. It was determined that 69,6% of the participants did not use any analgesics in this process and 50,6% of the participants had continuous pain (Table 2).

It was found that 55,4% ( $n=175$ ) of the patients did not perform the prescribed home exercise program. According to gender analysis of exercise, it was seen that there were statistically more men who train than women (Table 3,  $p < 0.001$ ). No significant relationship was found between exercise and age, marital status, education and occupation groups. Participants who did exercise constituted 42.6% of married ones and 50.9%

**Table 1.** Sociodemographic Characteristics for Patients' Exercise Status

	Did Exercise		Did Not Exercise		Total		Significant p value
	n	%*	n	%*	n	%*	
<b>Gender</b>							
Male	79	54,9	65	45,1	144	45,6	0,001
Women	62	36,0	110	64,0	172	54,4	
<b>Age</b>							
18-29	44	47,3	49	52,7	93	29,4	0,112
30-44	57	50,0	57	50,0	114	36,1	
45-65	40	36,7	69	63,3	109	34,5	
<b>Marital Status</b>							
Single	37	50,0	37	50,0	74	23,4	0,501
Married	98	42,6	132	57,4	230	72,8	
	6	50,0	6	50,0	12	3,8	
<b>Education</b>							
Illiterate	23	34,3	44	65,7	67	21,2	0,190
Primary education	57	44,2	72	55,8	129	40,8	
High school	27	50,9	26	49,1	53	16,8	
University	34	50,7	33	49,3	67	21,2	
<b>Profession</b>							
Tradesman	9	56,3	7	43,8	16	5,1	0,060
Civil servant	26	60,5	17	39,5	43	13,6	
Worker	35	50,7	34	49,3	69	21,8	
Retired	2	18,2	9	81,8	11	3,5	
Student	6	42,9	8	57,1	14	4,4	
Unemployed	19	42,2	26	57,8	45	14,2	
Housewife	44	37,3	74	62,7	118	37,3	

\* row percentage; \*\* column percentage

**Table 2.** The Pain-Related States of Patients

	n	%
<b>Pain region</b>		
Neck	103	32,6
Low Back	132	41,8
Shoulder	29	9,2
Knee	52	16,5
<b>Pain duration</b>		
0-1 month	55	17,4
2-6 month	81	25,6
6 month - 1 year	60	19,0
1-5 years	80	25,3
5-10 years	40	12,7
<b>Physiotherapy-Exercise</b>		
Yes	70	22,2
No	246	77,8
<b>Have Taken Analgesic</b>		
Yes	96	30,4
No	220	69,6
<b>Pain Prevalence</b>		
Continuous	160	50,6
Periodic	131	41,5
Instant / Temporary	25	7,9

**Table 3.** Comparison of VAS Values of Participants

	Before Training	After Training	p
Did Exercise (n=141)	7,45±1,80	3,46±2,82	7,031
Did not Exercise (n=175)	7,62±1,80	5,54±2,33	0,001

of high school graduates.

A statistically significant result was found when the before and after exercise VAS data of participants who did exercise and those who did not were compared (Table 4, p=0.001).

**Discussion**

Pain negatively affects the lives of millions of people around the world and ranks first in the use of medical, financial, and social resources [11]. In this study, 316 patients with a mean age of 39,8 years applied for exercise therapy with pain in different body regions. In the study conducted by Iaroshevskiy et al. on 87 people with an average age of 39 years, the prevalence of pain in different body regions was found to be 40% [12]. In our study, 54,4% of the patients were women. This may be due to the greater incidence of musculoskeletal diseases in women due to gender-related biological factors, pain sensitivity, or psychological factors.

It has been reported that social support factors such as family existence and marital status provide better adaptation to pain [13]. Although 72,8% of the respondents were married, married participants were in the group with the lowest rate in the evaluation of the people who exercised.

Education, socio-economic status, and unemployment determine the duration and recurrence of MSD pain [14]. In the study carried out by Khosravi et al, it was found that those who are illiterate are 19,4% and those with high school or above are 64,8% [15]. In this study, when the relationship of the participants who did exercises with the education level was examined, it was found that non-literate people constituted the group with the lowest rate (34,3%) and high school graduates constituted the group with the highest rate (50,9%). As the level of education increased, the awareness of exercise increased.

Moya et al. reported that low back pain, which is one of the primary MSD, has a negative effect on many daily life activities, from standing to walking, weight-lifting, travel, social and working life, clothing, and sexual relations [16]. In this study, 60,5% of the exercisers were found to be civil servants as highest. The rates of retirees (18,2%), housewives (37,3%), and those who did not work were low. In the study by Kılıç et al., it was determined that the active workers (69,4%) were more likely to exercise than those who were not active (52,2%) [17]. These long-term problems turn into a chronic picture and create a burden on patients, employers, and the health system. This burden brings along economic losses [18].

In our physical therapy unit, the most frequently treated body regions were low back, neck, knee, and shoulder, respectively. This has been found to be compatible with the detection of the frequency and distribution of MSD pain in the community and to identify these four regions as the most common regions of pain [19]. According to the results of the study conducted by Quintana et al., the most pain areas defined by the participants

were waist, knee and hand regions, respectively [20]. Similarly, a study in the UK showed that the most severe pain to withstand was in the low back (25%), neck (18%), knee (17%), and shoulder regions (17%) [21].

In this study, 22,2% of the participants had previously received physical therapy or did exercises for their disease.

The results showed that 30.4% of people with pain used medication for pain. In a study investigating the prevalence of pain, it was reported that 96.7% of the 91 patients with pain used pain medication and 67.8% used analgesics daily. The prevalence of analgesic use was found to be in the range of 27-44% among the pain relief methods in the elderly. These findings indicate that the use of medication is important for relieving pain [22].

It is important to maintain continuity of exercise therapy in the control of painful diseases related to the musculoskeletal system [23]. It was determined that 44.6% of the participants did their exercises regularly and 55.4% did not. In the study by Suyabatmaz et al., the rate of patients with exercise habits was found to be 10.8% [24]. The increasingly popular vision is to support individuals to become active participants in the management of their diseases and to create opportunities. It is stated that it is possible to take the disease under control through patient education and exercise programs [25].

A statistically significant result was found when the before and after exercise VAS data of participants who did exercise and those who did not were compared. In the study by Kilic, more than half of the patients who exercised benefited from the exercises they performed and stated that the exercise decreased the problems such as pain, locking, fatigue, and limitation of movement due to disease [17]. Baczyk and colleagues found that planned home exercises had reduced complaints regarding increased pain, stiffness, falls, and so on [26].

It is suggested that the variables related to the communication and interaction of physiotherapists with their patients are important for determining compliance with home exercises. In the studies by Elnaggar et al., patients with mechanical low back pain applied an exercise program at home with their physiotherapist supervision for 2 weeks. After the program, all scores of the McGill Pain Questionnaire decreased [27].

### Conclusion

It was found that the community did not show sufficient sensitivity to exercise regularly. The patients who had low back, neck, knee, and shoulder pain had decreased pain, stress, and concentrated more in daily life when they performed the exercises.

In today's health policies, preventive health services are seen as the most baseline method and for this purpose, exercise is given priority. It will be useful to include a wider range of training practices on issues that increase the sensitivity of the society to exercise by using professional health personnel and mass media.

### Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

### Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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### Conflict of interest

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