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Comparison of Effectiveness Levels of Manuel Therapy and Home Exercise Program in Women with Chronic Low Back Pain

Kronik Bel Ağrılı Kadın Hastalarda Ev Egzersiz Programı ile Manuel Terapinin Etkinlik Düzeylerinin Karşılaştırılması

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Abstract

Objective: Lumbago (Low Back Pain) is one of the health problems that is very common in developing countries and causes mental and psychological problems. This study aims to find out and compare the levels of effectiveness of manual therapy and home-based exercise programs on female patients diagnosed with Chronic Low Back Pain.

Materials and Methods: Sixty female patients between the ages of 18-65 who were diagnosed with chronic low back pain as a result of clinical and radiological examinations were included in the study. The patients were divided into two groups in a randomized controlled way. While the first group was administered manual therapy and electrotherapy modalities, the second group was administered home-based exercise program and electrotherapy modalities during ten sessions by a physiotherapist. The first assessments were made at the beginning of the treatment, and the second assessments were made after the 2-week treatment was completed. Visual Analogue Scale (VAS) was used for pain level and Pittsburgh Sleep Quality Index (PSQI) was used for sleep quality level.

Results: In both groups, a significant difference was found statistically in terms of the severity of pain and sleep quality (in manual therapy group $p<0.001$ and $p<0.001$, respectively; home exercise group $p<0.021$ and $p<0.001$, respectively). The improvement in pain level and sleep quality were found to be higher in the manual therapy group compared to the home exercise group with the patients followed up for ten sessions. Difference between VAS in home exercise group before and after treatment was 2.91 ± 1.78 cm and in manual therapy group before and after treatment was 4.68 ± 1.44 cm. Difference between PSQI in home exercise group between pre-treatment and post-treatment was 2.16 ± 2.29 cm and in manual treatment group was 4.10 ± 1.97.

Conclusion: Manual therapy applications were found to be superior to home exercise programs in reducing the general pain level and creating a positive effect on the sleep quality of the patients. For this reason, manual therapy applications should be widespread in the physical therapy and rehabilitation process.

Keywords: Manual Therapy, Myofascial Stretching, Home-Based Exercise, Low Back Pain, Electrotherapy

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Öz

Amaç: Bel ağrısı, gelişmekte olan ülkelerde oldukça yaygın görülen ve ruhsal ve psikolojik bir takım sıkıntılara yol açan sağlık sorunlarından biridir.Bu çalışmanın amacı kronik bel ağrısı tanısı konan kadın hastalarda manuel terapi ve ev egzersiz programının hastalar üzerindeki etkinlik düzeylerinin karşılaştırılmasıdır.

Gereç ve Yöntemler: Çalışmaya klinik ve radyolojik muayeneler sonucunda kronik bel ağrısı tanısı almış 18-65 yaş arası 60 kadın hasta dahil edildi. Hastalar randomize kontrollü olarak iki gruba ayrıldı. Birinci gruba manuel terapi ve elektroterapi modaliteleri uygulanırken, ikinci gruba da bir fizyoterapist tarafından hazırlanmış ev egzersiz programı ve elektroterapi modaliteleri on seans uygulandı. İlk değerlendirmeler tedavinin başlangıcında, ikinci değerlendirmeler ise 2 haftalık tedavi tamamlandıktan sonra yapılmıştır. Ağrı düzeyi için Görsel Analog Skalası (VAS), uyku kalitesi düzeyi için Pittsburgh Uyku Kalitesi İndeksi (PSQI) kullanıldı.

Bulgular: Her iki grupta da ağrı şiddeti ve uyku kalitesi açısından istatistiksel olarak anlamlı bir fark bulundu (manuel terapi grubunda sırasıyla $p<0,001$ ve $p<0,001$; ev egzersizi grubunda sırasıyla $p=0,021$ ve $p<0,001$). On seans takip edilen hastaların ağrı düzeyi ve uyku kalitesindeki iyileşme, manuel terapi grubunda ev egzersiz grubuna göre daha yüksek bulundu. Tedavi öncesi ve sonrası VAS değerleri arasındaki fark ev egzersizi grubunda 2,91 ± 1,78 cm, manuel terapi grubunda 4,68 ± 1,44 cm idi. Tedavi öncesi ve tedavi sonrası PSQI değerleri ev egzersizi grubunda 2,16 ± 2,29, manuel tedavi grubunda 4,10 ± 1, 97 idi.

Sonuç: Manuel terapi uygulamaları hastalarda; genel ağrı düzeyini azaltmada ve hastaların uyku kalitesi açısından olumlu bir etki oluşturmada ev egzersiz programlarına göre daha üstün bulunmuştur. Bu nedenle fizik tedavi ve rehabilitasyon sürecinde manuel terapi uygulamaları yaygınlaştırılmalıdır.

Anahtar Kelimeler: Manuel Terapi, Myofasyal Germe, Ev Egzersizi, Bel Ağrısı, Elektroterapi

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Introduction

Low back pain is a health problem that occurs sometimes for mechanical and neurological reasons and sometimes for unknown reasons. This disease, which is very common in individuals living in changing living conditions and poses a serious problem for society, causes a significant financial and job loss (1). While standing upright, bending forward and lifting weights, disorders in static and dynamic posture, deterioration in body mechanics and bad posture may occur. Loss of active workdays, limitation of mobility caused by fear of pain, decrease in quality of life, tendency to become depressed, and disruption of sleep patterns are among the problems seen (2). There are different treatment methods for low back pain, especially surgical, conventional and medical treatment approaches.

There have been many studies comparing the effectiveness of known treatment approaches to solve the problem of low back pain, both in the clinic and in the literature. Physical therapy and rehabilitation, which are conventional treatment approaches, have an important place in the treatment of chronic low back pain (2). The aim of physical therapy agents, which are generally preferred in the treatment of low back pain, is to provide symptomatic treatment by reducing pain, inflammation, muscular symptoms and functional contracture in the joint3. Programs designed to reduce low back pain and increase functional capacity consist of exercise training, manual therapy, movement and activity modifications, and psycho-social approaches, and are preferred in patients with chronic pain. Exercise training is an irreplaceable approach in physical therapy and rehabilitation practices in the treatment of many musculoskeletal problems and chronic diseases (3). It is therefore the cornerstone of preventive rehabilitation. In addition, it is an indispensable treatment method for loss of movement due to injury, reducing pain and regaining motor function ability (4). Manual therapy is the use of the practitioner's hands and/or fingers on the individual's body for evaluation, diagnosis and treatment as a non-surgical conservative approach skill in various conditions and symptoms (5). In manual therapy, therapists use only their hands to press on muscle tissue to manipulate and mobilize joints in the area to reduce muscle spasm, muscle tension, and pain caused by joint dysfunction. Manual therapy includes manual techniques such as high velocity low amplitude trust techniques, medium velocity medium amplitude trust techniques, spinal manipulation, soft tissue stretching, rolling and pressure techniques, myofascial stretching and relaxation techniques, myofascial pain point therapy (counterstrain), positional therapy and muscle energy techniques, visceral techniques, or exercise prescriptions6. Manual therapy can be applied to many tissues and areas of the body, especially to the lumbosacral, cervical and thoracic regions.

The aim of the present study is to compare the effectiveness of manual therapy and home exercise program in female patients diagnosed with chronic low back pain.

Materials and Methods

The present study was conducted with female patients who came to the Physical Therapy and Rehabilitation Unit of a university hospital for regular treatment between December 2017 and February 2018. The study, which included 60 female patients with chronic low back pain, is a prospective randomized and single-blind study. The patients were unaware of the groups, however the working physiotherapist was aware of the groups and assessments. Coin flip method was used in randomization and each case was included in the method independently of each other. Ethics committee approval for the study was obtained under the number 179 on 21/12/2017 at Duzce University Non-Interventional Health Research Ethics Committee. In addition, the signed consent of the patients was obtained and the study was initiated in accordance with the Declaration of Helsinki.

Inclusion criteria: Being between the ages of 18-65, having low back pain lasting longer than 6 weeks, being diagnosed with chronic low back pain as a result of clinical and radiological examinations, being able to come to the outpatient treatment program, being able to comply with the treatment program to be applied, being a female, and not having any physical or mental disability.

Exclusion criteria: Being under the age of 18 or over the age of 65, being a male, having a secondary disease that prevents treatment, refusing to voluntarily participate in the study, and pregnant patients.

The independent variables in our study are manual therapy application and home exercise program application, and the dependent variables are general pain status and sleep quality variables. The index and scale applied are Visual Analogue Scale (VAS) and Pittsburgh Sleep Quality Index (PSQI). In the VAS scale, it is aimed to convert the emotional state of the patient about pain into numerical data. While evaluating the VAS, the patients were asked in what range they would express their pain during activity between 0 and 10 (0 = no pain, 10 = unbearable pain) (6). The same procedure was repeated both before and after the treatment and recorded by the physiotherapist. The 24 question PSQI scale, which was developed by Buysse et al. in 1989 and provides a quantitative measurement of sleep quality, was read to the patients by the physiotherapist as a question-answer both before the treatment and after 10 sessions of treatment (7). The Turkish validity and reliability study of the scale was carried out by Ağargün et al., and the internal consistency coefficient was specified as 0.80. PSQI consists of 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction. Although PSQI consists of 24 items, it is calculated over 19 items. The index consists of open-ended questions and multiple choice questions. Each of the multiple-choice questions is given a score between 0-3 by the individuals. The total PSQI score is obtained by summing the seven component scores. The total score obtained from this index varies between 0-21, those who score above 5 are considered to have "poor sleep quality", and those who score 5 and below are considered to have "good sleep quality"(7). While manual therapy methods and electrotherapy modalities (ultrasound, tens, hot pack) were applied to the first group, the home exercise program prepared by the physiotherapist and electrotherapy modalities (ultrasound, tens, hot pack) were applied to the second group. Electrotherapy modalities were applied to each patient by physical therapy technicians in the unit once a day for 10 sessions with Ultrasound for 3 minutes, TENS for 20 minutes and Hotpack for 10 minutes. Physical therapy technicians are study blind. Each of the applied manual therapy methods was applied to the patients in the manual therapy group once a day for 10 sessions by the working physiotherapist. Myofascial stretching was performed by manually stretching the fascia of the lumbosacral muscles while the patient was lying face down. In the neurological traction technique to the quadratus lumborum muscle, the physiotherapist made deep pulls on the quadratus lumborum muscle with the hypothenar part of his hand while the patient was lying face down. In the paravertebral z-stretching technique, the paravertebral muscles were cross-stretched. Lumbar region mobilization and stretching to the piriformis muscle were also performed by the physiotherapist while the patient was lying on his back (Figure 1). The total duration of manual therapy applications was kept constant at 20 minutes, each being 4 minutes.

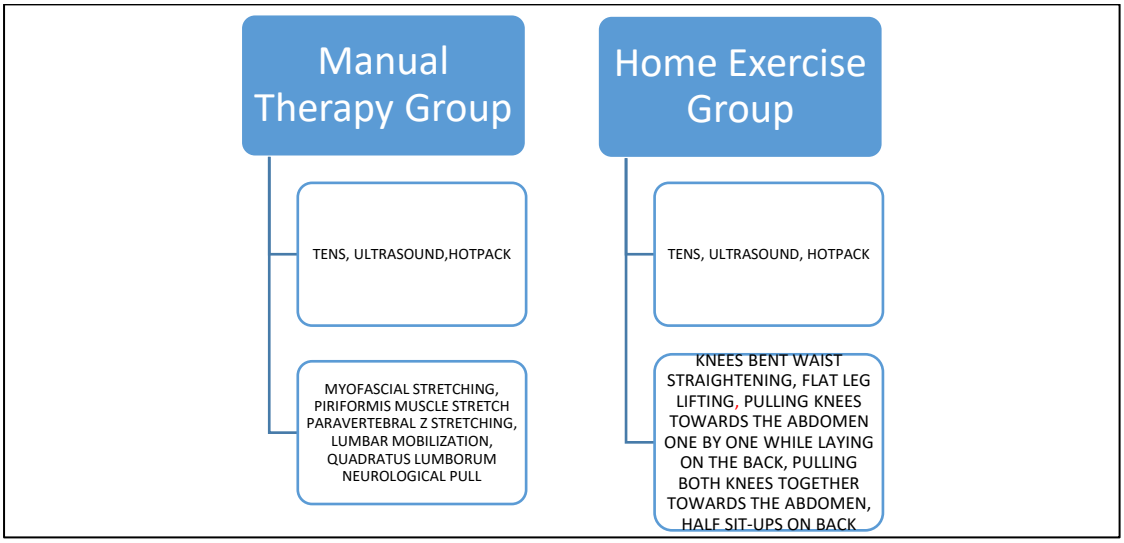

Figure 1. Treatment Administration Chart

Exercises that provide lumbar region stabilization and strengthen the lumbar region stabilizer muscles were selected and a special form was created (Figure 2). These exercises include waist straightening with knees bent while the patient is lying on his back, pulling and releasing the knees one by one towards the abdomen, pulling both knees together towards the abdomen, straight leg raises and half sit-ups with the knees bent to work the upper abdominal muscles. The patients in the home exercise group were asked to perform the determined 5 lumbar region therapeutic exercises regularly for 10 sessions with 15 repetitions 3 times a day. The exercises were performed by the working physiotherapist once for each patient in the unit for 10 sessions, and subsequent follow-up was provided. Exercise diaries of the patients were followed up. Verbal statements were taken from the patients that they did the exercises regularly at home for 10 sessions. 90% of the patients reported that they did the exercises in 3 sets per day for 10 sessions. The exercises lasted 15 minutes in each session.

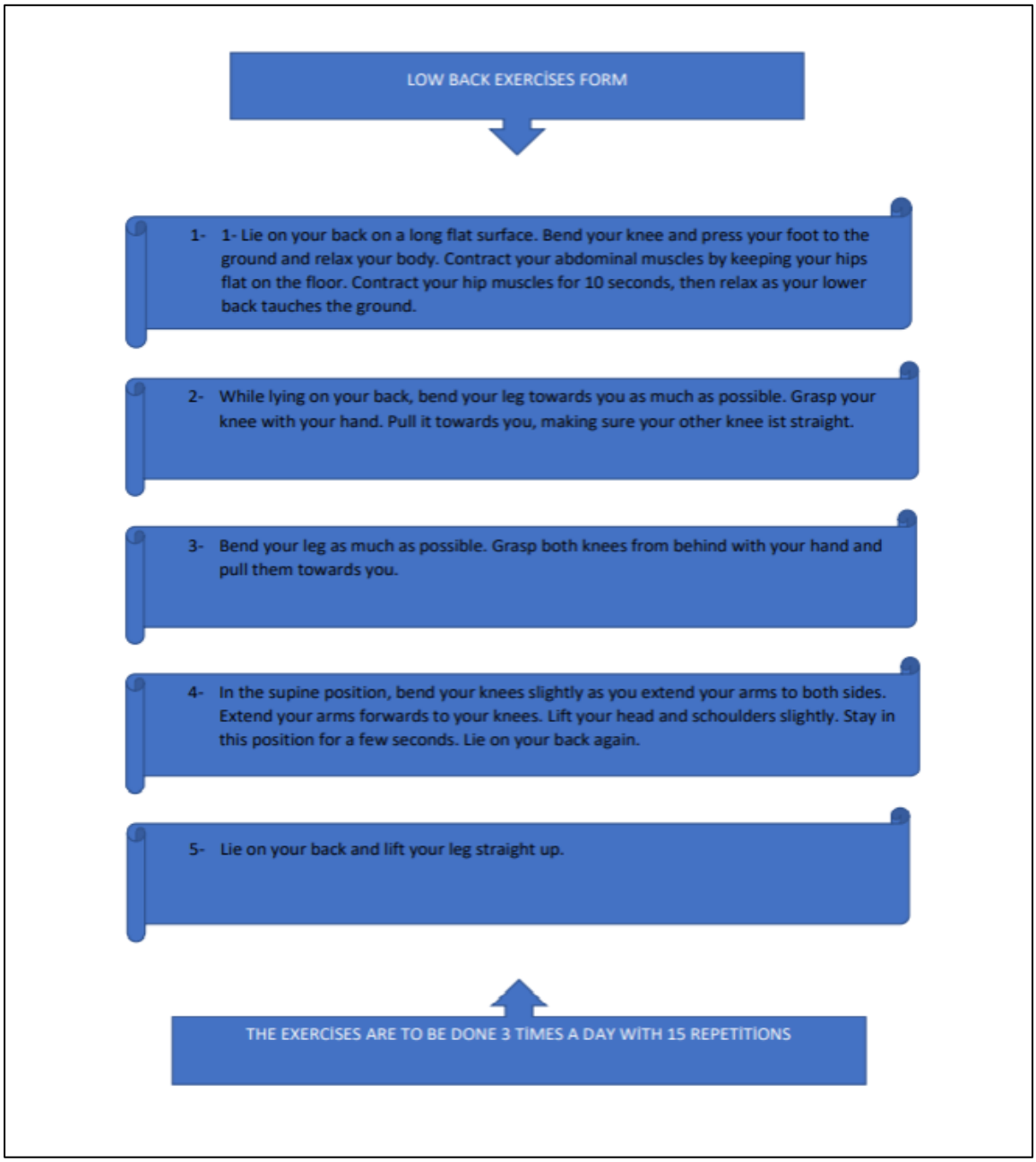

Figure 2. Therapeutic Low Back Exercises

Statistical Analysis

Data analysis was done with SPSS 21.0 for Windows. In order to summarize the data obtained in the study in terms of demographic characteristics according to the groups, considering the results of the Shapiro Wilk normality test, t-test was applied for continuous variables with normal distribution in independent groups, and Mann-Whitney U test was applied for variables that did not meet the normality assumptions.

Percentage distributions of discrete data and averages of continuous data were calculated. Student's t test was used to compare means in independent groups. In the cross tables, Chi-square analysis was used to evaluate the difference between groups determined by counting, and Student's t test was used to evaluate the difference between groups determined by measurement. P values <0.05 were considered significant.

Results

The age and body mass index (BMI) distribution of the demographic characteristics of the patients are shown in Table 1. More than half of the patients in both groups are in the age range of 35-54. When we look at the general distribution in terms of body weight, we see that there are more than 50% obese individuals in both groups.

Table 1

Demographics of Age and Body Mass Index (BMI) Distribution of Individuals by Groups

	Home Group Exercise	**Manual Group Threapy**		**P value**
Age (year) (X±Sd)	47.73±10.67	40.66 ±11.61		0.706*
Age Ranges	**N (%)**	**N (%)**		
18-34	6 (20.0)	7 (23.3)		
35-54	18 (60.0)	17 (56.7)	X^2=0.105**	**0.017****
55-65	6 (20.0)	6 (20.0)		
TOTAL	30 (100)	30 (100)		
Body Mass Index (kg/m2) (X±Sd)	31.77±6.42	30.01±5.03		0.232*
Body Mass Index Distribution	**N (%)**	**N (%)**		
Normal	4 (13.3)	5 (17.7)		
Overweight	8 (27.7)	9 (30.0)	X^2=0.287**	0.243**
Obese	18 (60.0)	16 (53.3)		
TOTAL	30 (100)	30 (100)		

*Independent Samples Test, **Chi-Square Test, Body Mass Index, X±Sd: Mean ± standart deviation

The comparison of the pre-treatment (PRE-T) and post-treatment (POST-T) VAS and PSQI values of the patients are given in Table 2 and Table 3 below.

The comparison of the home exercise group and the manual therapy group in terms of VAS values in the pre-treatment period does not reveal a statistically significant difference (p>0.05) (Table 2). After the treatment, the pain level decreased in both groups in group comparisons. Considering the comparison between the groups, pain level decrease is seen more in the manual therapy group. Post-treatment values indicate a statistically significant difference in terms of VAS home exercise group and VAS manual therapy group (p<0.05) (Table 2).

Table 2

Comparison of the Pre-Treatment VAS and Post-Treatment VAS Means of the Groups

	Pre-Treatment VAS (cm)	**Post-Treatment VAS (cm)**	**Difference**	**P value Pre vs post-treatment**
Home exercise group	6.37 ± 2.10	3.46 ± 1.34	2.91 ± 1.78	0.021
Manual therapy group	6.79 ± 1.75	2.11 ± 1.06	4.68 ±1.44	<0.001
P value Home ex-group vs manuel group	0.401	<0.001		

VAS: Visual Analogue Scale

Table 3

Comparison of the PSQI values of the cases in terms of Pre-Treatment and Post-Treatment differences

	Pre-Treatment PSQI	**Post-Treatment PSQI**	**Difference**	**P value Pre vs post-treatment**
Home exercise group	9.33±3.85	7.17±2.66	2.16±2.29	<0.001
Manual therapy group	11.27±3.20	7.17±2.24	4.10 ±1.97	<0.001
P value Home ex-group vs manuel group	0.031	<0.001		

PSQI: Pittsburgh Sleep Quality Index

When the PSQI values of the cases were examined, a statistically significant difference was found in terms of pre-treatment sleep quality indices of the home exercise group and the manual therapy group (p<0.05) (Table 3). In other words, it is seen that the groups did not show a homogeneous distribution according to their PSQI scores in the pre-treatment period. When we looked at the post-treatment values, no statistical difference was found. A statistically significant difference was found in the difference between the groups whose post-treatment means were close to each other (p<0.05). The sleep quality increased significantly more in the manual therapy group compared to the home exercise group.

Discussion

In the present study, we found that manual therapy was superior to home exercise program in terms of reducing pain level and increasing sleep quality in women with chronic low back pain. In both groups, we observed a decrease in the pain levels of the patients and an increase in their sleep quality.

There are many different studies in the literature investigating exercise applications in manual therapy and physical therapy. Investigating the effect of manual therapy and exercise in patients with chronic low back pain, Ulger et al. conducted a double-blind randomized controlled trial. They divided 113 patients into two groups as spinal stabilization and manual therapy groups. They applied spinal stabilization exercises to

the first group and soft tissue mobilizations to the second group. They used the VAS for pain assessment. They found that both treatments were effective in pain, function and quality of life sub-parameters. They reported that manual therapy was more effective than spinal stabilization technique in reducing pain and improving functional status (8). Our study also supports the work of Ulger et al. In our study, when we look at the pre and post-treatment VAS values, the curative effect of manual therapy in terms of both reducing the pain and sleep quality is supported by data. Manual therapy, with its various techniques, has an important healing effect in physical therapy patients, especially in disease states with chronic pain. One of these studies is the retrospective observational study of Cook et al. in which they investigated the long-term effectiveness of manual therapy. They evaluated the short-term efficacy of treatment in patients with chronic low back pain after two weeks of regular manual therapy. They reassessed the patients they treated after 6 months to assess the medium-term efficacy. They reported that the long-term recovery rate was higher in the group of patients who showed greater improvement after two weeks of manual therapy (9). In this study, unlike our study, the long-term curative effect of manual therapy was investigated and it was emphasized that the post-treatment effect was longer in low back pain patients. In our study, which we limited to 10 sessions, the appearance of a satisfactory picture between the first and last evaluations of the patients showed the short-term benefit of our treatment. Although we could not look at the long-term efficacy of our study, the short-term recovery status is consistent with the study of Cook et al. According to Krekoukias et al. conducted a randomized controlled trial comparing the effectiveness of spinal mobilization techniques and conventional physiotherapy in the treatment of chronic low back pain due to spinal disc degeneration. They included 75 patients with chronic low back pain for more than three months in this study and divided the patients into three groups. They applied manual therapy to the first group, placebo treatment to the second group, and conventional physiotherapy to the third group. They found that manual therapy and traditional physiotherapy had a curative effect in all cases. They reported that manual therapy was superior to traditional therapy in reducing pain severity and disability. (10). The results of our study are consistent with the above study. In our study, we think that deep drawings applied to the quadratus lumborum muscle and stretching to the lumbar region fascia provided more relaxation in the lumbar region and caused a greater reduction in pain in the manual therapy group.

Manual therapy, the importance of which has been increasing in recent years, is also preferred more and more by physiotherapists. Even though movement is diminishing from our lives, exercise maintains its importance in today's society as it is in every period. In our study, we also found reductions in pain value in the home exercise group. In this group's exercise program, choosing the movements to strengthen and relax the Lumbar stabilizer muscles and performing the exercises regularly may have caused the pain to decrease. In our study, ultrasound, hotpack and tens, which are electrotherapy agents, were applied to both groups for ten sessions before manual therapy and exercise. Since it was applied to both groups, the effectiveness of electrotherapy in the healing process could not be determined. Caglar et al. In their study with 27 female individuals, they investigated the effect of manual connective tissue massage on pain and sleep quality. They formed two groups of 13 and 14 people and applied home exercise to one group and home exercise and connective tissue massage to the other group. They found a certain difference between the groups in terms of pain severity and improvement in sleep quality. They reported that manual massage had a more effective healing effect than exercise alone (11). In our study, we investigated to what extent manual therapy and exercise improve sleep quality in patients with chronic pain. In our study, manual therapy PSQI pretreatment scores were found to be higher than home exercise group PSQI pretreatment scores. In post-treatment values, the PSQI score showed a more severe decrease in the manual therapy group. When the groups were compared with each other, the difference between them was found to be statistically significant ($p<0.05$). The healing effect of manual therapy in patients with low back pain is also important in terms of sleep quality. In addition, the increase in sleep quality in the manual therapy group in our study was higher than the increase in sleep quality in the home exercise group. As a result, we can say that the sleep quality has increased in a way that is inversely proportional to the decrease in the pain level in the groups.

Conclusion

Physical therapy and rehabilitation applications accelerate the treatment process in cases of low back pain. Home exercise programs and manual therapy methods organized by physiotherapists are very effective in the treatment process. Proper and correct manual therapy applications were found to be more successful than home exercise programs in reducing the general pain level and creating a positive effect on the sleep quality of the patients. Manual therapy methods, whose importance is increasing day by day in physical therapy and rehabilitation applications, will be used more widely in conventional and preventive treatment programs.

The fact that the study was single-blind was due to the small number of physiotherapists who would perform the application. Power analysis of the study was not performed. No specific criteria were used for age grouping. With VAS, only the pain status of the patients at the activity level was evaluated. Other pain scales could not be used in the assessment of pain due to the high patient density in the treatment unit. The sub-parameters of the PSQI scale were not included in the study because they were not studied in detail. In the home exercise program, the two sessions that the patients had to do at home were limited to the patient's statement, although they were followed up.

Ethics Committee Approval: Ethics committee approval for the study was obtained under the number 179 on 21/12/2017 at Duzce University Non-Interventional Health Research Ethics Committee.

Informed Consent: Written consent was obtained from the participants.

Conflict of Interest: Authors declared no conflict of interest.

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