



The Relationship Between Physical Activity Level and Exercise Perception and Low Back Pain

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ABSTRACT

The aim of this study was to investigate the effectiveness of physical activity levels on the perception of the benefits of exercise and the perception of the barriers to exercise and low back pain. Individuals with mechanically induced low back pain were included in our study. Participants were asked to fill out a personal information form and were divided into three groups using the International Physical Activity Questionnaire (short) scale. Then, the Quebec Low Back Pain Disability Scale and the Benefits of Exercise / Barriers to Exercise Scale were applied to the participants. The data obtained in the study were evaluated in SPSS 24 package programme. There was no difference in the demographic characteristics of the participants in our study. In the evaluations made as a result of the study, exercise benefit status according to physical activity levels; While a significant relationship was found between physical activity levels and low back pain ($p<0.05$); There was no significant difference between physical activity levels and exercise disability status ($p>0.05$). Our study shows that the level of physical activity has an effect on the benefit obtained from exercises and low back pain, and it is recommended to perform and improve physical activity due to these two conditions.

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INTRODUCTION

Low back pain can be defined as pain in the region extending from below the thoracic vertebrae or costal margins to the inferior gluteal regions, regardless of the presence of leg pain (1).

Low back pain may be caused by a specific pathology (tumor, fracture, radicular syndrome) or may occur in the absence of any pathology. Low back pain that occurs due to mechanical causes without any identifiable pathology is called non-specific low back pain (2).

Non-specific low back pain is the most common condition among low back pain. Age, gender, deterioration in general health status, physical and psychological stress on the spine are the main risk factors for this condition (3,4).

Non-specific low back pain is a common symptom in people of all ages and socio-economic status. In a 2017 study, 7.83% of 577 million people worldwide were affected (5).

Despite this high prevalence, the prognosis for non-specific low back pain is good. Acute and subacute affected individuals show significant symptom improvement within 6 weeks, while moderate intensity pain may persist for up to 12 months (6).

There are multiple pharmacologic and non-pharmacologic treatment protocols recommended for episodes in patients with nonspecific low back pain. The effectiveness of these treatments may vary from treatment to treatment. However, in the treatment guidelines that have emerged in recent studies, participation in light physical activity is emphasized for primary care, while pharmacological treatments and physiotherapy applications are in question in the need for second-line treatment (7,8).

Physical activity, which is recommended to be used in the first care of patients with nonspecific low back pain, is defined by the World Health Organization as a physical movement that requires energy expenditure due to the use of skeletal muscles. Exercise, on the other hand, is defined as an activity that is examined under the title of physical activity and is planned to maintain physical fitness and repeated individually (9).

Exercise therapy is also defined as “a physical activity regimen or plan designed and prescribed for specific therapeutic goals to restore normal musculoskeletal function or reduce pain caused by disease or injury”. People with non-specific low back pain seeking primary health care are usually given education or exercises by physiotherapists. Different types of exercise are used in the treatment of non-specific low back pain, such as strength and aerobic training on land or in water, as well as specialized exercises such as motor control exercises, suspension exercises, Pilates, yoga and traditional Chinese exercises such as Tai Chi and Qi Gong (10).

In our study, we hypothesized that there would be a positive correlation between the physical activity levels of patients with non-specific low back pain, pain-related disability and the effects of the exercises performed.

METHODS

Participants

The population of our study consisted of the students of the vocational school of health sciences at X University. Necessary information was given to the individuals for the study and individuals who volunteered to participate in the study were included.

Inclusion criteria

- Volunteering to participate in the study
- Signing the consent form prepared for the study
- Over 18 years of age
- Not having any history of surgery

Exclusion criteria

- Under 18 years of age
- Not signing the consent form
- Previous surgical operation
- Exposure to low back pain due to a known cause
- Physiotherapy and rehabilitation treatment within the last six months
- Having received medical treatment for low back pain within the last six months

Method

A personal information form was filled out for all individuals who agreed to participate in the study and signed the consent form. In order to evaluate the physical activity levels of the participants, the International Physical Activity Questionnaire,

which consists of 7 questions and is based on the last week, the Quebec Low Back Pain Disability Scale to evaluate the disability caused by low back pain, and the Benefits/Barriers of Exercise Scale, which evaluates the benefits and barriers to exercise, were completed by the participants.

Data Collection Tools

Descriptive Information Form

The Descriptive Information Form was created by the researchers by reviewing the literature. It consists of 4 questions about the descriptive characteristics of the students who will participate in the study such as age, body mass index, smoking, family income status.

International Physical Activity Scale

The International Physical Activity Questionnaire (IPAQ) was developed to determine the physical activity levels of participants. The IPAQ was developed to obtain valid and comparable information about the level of physical activity based on self-reports of daily physical activity in the international arena. In this study, the self-administered Last 7 Days short form of the scale (IPAQ ShortForm) was used. The validity and reliability study of the IPAQ short form used in this study was conducted by Melda Öztürk in 2005. IPAQ short and long forms provide reproducible and comparable data ($r=0.69$ for short form and $r=0.64$ for long form). Criterion validity was found to be $r=0.30$ for the short form and $r=0.29$ for the long form (11).

Quebec Low Back Pain Disability Scale

The Quebec Low Back Pain Disability Scale was developed in 1995. In the Quebec Low Back Pain Disability Scale, the patient is asked 20 questions about daily activities and is asked to select the appropriate option on a scale from 0 (not at all difficult) to 5 (impossible to do). The total score ranges from 0 to 100 points, with a higher score indicating a higher disability. The Turkish version of the Quebec Low Back Pain Disability Scale, Validity and Reliability study was conducted in 2009 (12,13).

Benefits of Exercise/Barriers to Exercise Scale

It is a scale developed by Zheng et al. (14) in 2010 to assess patients' perception of exercise benefits/barriers. The scale consists of 24 items and 2 open-ended questions. While 12 of the 24 items of the scale consist of statements about the benefits of exercise, the other 12 items consist of statements that prevent exercise. The benefits sub-dimension consists of items 1, 2, 3, 4, 6, 7, 10, 13, 16, 20, 22, 23. The barriers sub-dimension consists of items 5, 8, 9, 11, 12, 14, 15, 17-19, 21 and 24. The scale was evaluated with a 4-point Likert scale. It was scored as 4 (Strongly Agree), 3 (Agree), 2 (Disagree) and 1 (Strongly Disagree). The barrier factors (12) in the DPEBBS scale are in the form of negative questions and need to be transformed in the evaluation. The scale is evaluated on a total score (min=24,

max= 96). Higher scores indicate a perception of more exercise benefits and less exercise barriers (14).

Ethics

The study was conducted in accordance with the Declaration of Helsinki (“World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects,” 2013) and informed consent was obtained before data collection. The studies were approved by the Ethics Committee of Artvin Çoruh University Rectorate (Document Date and Number: 16.04.2024-E-18457941-050.99-132262).

Statistical Analysis

The data obtained from the study were analyzed using IBM SPSS v27 program. Descriptive statistics (mean, standard deviation, number and percentage) were used in the evaluation of the data. The suitability of the variables for normal distribution was evaluated by Kolmogorov-Smirnov Test. The difference between the groups of quantitative variables showing normal distribution was evaluated with Independent Sample T-Test and ANOVA Test, and this difference in qualitative variables was analyzed with Chi-Square Test. If the ANOVA Test was found to be significant, the LSD Test, which is a frequently used Post-Hoc comparison, was applied to ensure equality of variance, since the group sizes were not equal. Pearson Correlation Analysis was used to evaluate the correlation between quantitative variables. The correlation coefficient obtained from this analysis, in absolute value, between 0.70-1.00 is defined as a strong relationship; between 0.70-0.30 is defined as a moderate relationship; and between 0.30-0.00 is defined as a low level relationship.

RESULTS

No significant difference was found between men and women in terms of age, BMI and alcohol use ($p>0.05$). The rate of smoking was found to be higher in males than females in our study ($p<0.05$) (Table 1).

There is no statistically significant difference in the barrier values in terms of physical activity levels ($p>0.05$). Significant variability was observed in benefit values in terms of physical activity levels ($p<0.05$). As a result of LSD test, significant differences were observed between inactive and minimum active groups in favor of inactive group and between minimum active and very active groups in favor of minimum active group ($p=0.004$; $p=0.005$). Again, significant variability was observed

in low back pain values in terms of physical activity levels ($p<0.05$). As a result of LSD test, significant differences were observed between inactive and minimum active groups in favor of minimum active group and between minimum active and very active groups in favor of very active group ($p<0.001$; $p<0.001$) (Table 2).

Table 1. Demographic Characteristics of the Individuals Included in the Study.

Features	Female (n=72) Mean ± SD	Male (n=62) Mean ± SD	P*
Age (years)	32.72±13.41	34.24±13.88	0.521
BMI (kg/m²)	24.20±4.53	25.03±4.19	0.274
	n (%)	n (%)	P**
Cigarette			0.003
Using	15 (20.8)	28 (45.2)	
Non-use	57 (79.2)	34 (54.8)	
Alcohol consuming			0.474
Yes	1 (1.4)	2 (3.2)	
No	71 (98.6)	60 (96.8)	

* Independent Sample T-Test; significance value $p<0.05$. **Chi square Test; significance value $p<0.05$. SD: Standard deviation, BMI: Body mass index.

Table 2. Disability, benefit and low back pain values in terms of physical activity levels.

Physical Activity Level	Inactive (n=39) Mean ± SD	Minimum Active (n=64) Mean ± SD	Very Active (n=31) Mean ± SD	p*
Obstacle	30.54±6.06	31.00±7.22	28.58±8.55	0.307
Benefit	60.05±13.51	59.13±11.70	51.77±9.11	0.007
Low Back Pain	43.54±17.96	21.42±10.85	8.39±6.55	<0.001

*ANOVA Test; significance value $p<0.05$. SD: Standard deviation.

A positive, low-level linear relationship was found between barrier and benefit variables, barrier and low back pain variables, benefit and low back pain variables ($p<0.05$) (Table 3).

Table 3. Correlation between disability, benefit and low back pain variables.

Variables	Obstacle		Benefit		Low Back Pain	
	r	p*	r	p*	r	p*
Obstacle	-	-	0.261	0.002	0.187	0.030
Benefit	0.261	0.002	-	-	0.380	<0.001
Low Back Pain	0.187	0.030	0.380	<0.001	-	-

* Pearson Correlation Coefficient; significance value $p<0.05$.

DISCUSSION

Our study was conducted to investigate the relationship between physical activity and low back pain in individuals with mechanical low back pain; the perception of benefits and barriers of exercises in individuals and physical activity.

In our study, a significant relationship was found between physical activity levels and low back pain. However, while there was a significant difference between the benefit provided by the exercises performed within the scope of physical activities and physical activity levels, there was no significant difference between physical activity levels and the perception of disability caused by exercises.

In the literature, different results were shared in studies examining the relationship between physical activity and low back pain. In a 2021 study, researchers examined the relationship between physical activity levels of teachers working in the field of special education and low back pain severity. As a result of the study, they explained that the severity of low back pain decreased with the decrease in total sitting time and the increase in physical activity time during the day (15).

In another study examining the relationship between physical activity level and low back pain, researchers conducted a study involving 260 young individuals. In the study, physical activity levels and low back pain and disability due to low back pain were evaluated. As a result of the study, the researchers reported that increased physical activity reduced low back pain, but this effect was weak (16).

In a study investigating the relationship of nonspecific low back pain with posture, core endurance and lumbopelvic stability in trainee physiotherapists, the researchers conducted a study with 97 trainee students. Within the scope of the study, physical activity, low back pain level, posture analysis and disability due to low back pain were evaluated. As a result of the study, the researchers explained that there was a positive weak relationship between low back pain severity and severe physical activity level, a positive moderate relationship between low back pain and minimal activity levels, and a positive moderate relationship between low back pain and inactivity (17).

In a study conducted to compare working posture, conditions and quality of life in teachers with and without chronic low back pain, 190 teachers were included in the study. Within the scope of the study, pain assessment, posture analysis, quality of life and physical activity levels of the participants were examined. As a result of the study, the researchers explained that physical activity/exercise should also be recommended for teachers with low back pain (18).

In our study, significant variability was observed in low back pain values in terms of physical activity levels. This variability showed that there was a negative relationship between increased physical activity and low back pain.

In a study investigating the relationship between low back pain and exercise, it was explained that high-intensity exercise may be better tolerated for low back pain and more effective in reducing disability than moderate-intensity exercise (19). However, it has been explained by different studies that

different exercise programs can reduce pain in different degrees on low back pain (20,218).

Studies comparing physical activity levels and perceptions of benefits and barriers caused by exercises in individuals with low back pain are fewer in the literature. In a study conducted in this context, nursing students' healthy lifestyle behaviors and exercise behaviors were examined. As a result of the study, a moderate positive relationship was found between the physical activity levels of the students and the benefits of exercise (22).

Another study was conducted to compare perceived exercise benefits and barriers in active and inactive university students and to determine the relationship between physical activity level and perceived exercise benefits and barriers in university students. As a result of the study, the researchers explained that while physical activity level was positively associated with exercise benefits, especially psychological perspective, it was negatively associated with barriers related to exercise environment and physical effort (23).

A study was conducted to investigate the effects of reformer pilates exercises on psychosocial parameters in healthy women. Self-esteem, anxiety level, exercise perception and quality of life were evaluated in the study. Within the scope of the study, the participants were divided into intervention and control groups. The intervention group completed 24 sessions of reformer pilates program for 8 weeks, 3 days a week, while the control group did not participate in any exercise program. As a result of the study, the researchers explained that the exercise benefits-obstacles scale-benefit score decreased significantly only in the experimental group (24).

In our study, while there was a significant variability in the benefit values in terms of physical activity levels, there was no significant difference in terms of disability perception status.

CONCLUSION

As a result of our study, it was observed that physical activity had significant effects on the perception of benefit from exercises and on low back pain. Physical activity is recommended for individuals with low back pain to reduce pain and increase perceived benefit.

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Conflict of Interest

Data are available on request to the authors.

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