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Fizisel Aktivite Seviyesi Bel Ağrısını Etkiler mi?

Does Physical Activity Level Affect Low Back Pain?

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ÖZ

Amaç: Bu çalışmanın amacı, bel ağrısına sahip genç bireylerde fiziksel aktivite düzeyi ile fiziksel yetersizlikler arasındaki ilişkiyi tespit etmektir.

Yöntem: Bu çalışmaya bel ağrısına sahip 260 birey (131 kadın ve 129 erkek) dahil edildi. Katılımcıların sosyodemografik özellikleri araştırmacılar tarafından hazırlanan değerlendirme formu ile değerlendirildi. Bel ağrısı Oswestry Özürlülük İndexi kullanılarak (OÖİ) belirlendi. Fiziksel aktivite düzeyi ise Uluslararası Fiziksel Aktivite Anketi'nin (UFAA) kısa formu ile değerlendirildi.

Bulgular: Oswestry Özürlülük İndexi ile UFAA toplam skoru arasında negatif yönde anlamlı bir fark bulunmuştur ($p = 0.01$; $r = - 0.142$). Erkeklerin fiziksel aktivite düzeyi (UFAA toplam skoru) kadınlardan daha yüksek iken, Oswestry skoru kadınlardan anlamlı derecede düşüktü ($p <0.05$). Beden Kitle İndeksi ile OÖİ skoru arasında anlamlı bir ilişki saptanmazken ($p >0.05$), UFAA toplam skoru ile istatistiksel olarak anlamlı bir fark saptanmıştır ($p <0.05$).

Sonuç: Bu çalışmanın sonuçlarına göre, fiziksel aktivite seviyesinin, bel ağrısına sahip genç bireylerde bel ağrısının neden olduğu fiziksel engeli etkileyebileceği bulunmuştur. Gençlerin fiziksel aktivite düzeylerini arttırmaya teşvik edilmesi gerektiğini düşünüyoruz. Sosyoekonomik özellikler ve bel ağrısını etkileyebilecek diğer parametreler göz önünde bulundurularak, tüm yaş gruplarında fiziksel aktivite ile bel ağrısına bağlı fiziksel yetersizlik arasındaki ilişkiyi inceleyecek çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Fiziksel aktivite, Bel ağrısı, Özürlülük, Fonksiyonellik

ABSTRACT

Objective: The aim of this study was to determine the relationship between physical activity level and physical disability in young individuals with low back pain (LBP).

Methods: This study included 260 individuals (131 females and 129 males) with low back pain. Participant's sociodemographic properties assessed with questionnaire prepared by researchers. Participant's physical disability was evaluated with Oswestry Disability Index (ODI). Physical activity level was evaluated by the short form of the International Physical Activity Questionnaire (IPAQ).

Results: There was found a negative weak correlation between the ODI and total score of IPAQ ($r = - 0.142$; $p= 0.01$). Male's total physical activity level was higher than women, while Oswestry score was significantly lower than women ($p<0.05$). Although there was no significant relation between Body Mass Index and ODI score ($p>0.05$), there was a statistically significant difference with IPAQ total score ($p <0.05$).

Conclusion: According to this study results, it was understood that physical activity level may affect the physical disability caused by low back pain in individuals with LBP. We believe that young people should be encouraged to increase their physical activity levels. We hope to conduct studies that will investigate the relationship between physical activity and physical disability in all age groups in consideration of socioeconomic characteristics and other parameters that may affect LBP.

Key Words: Physical activity, Low back pain, Disability, Functionality

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1. INTRODUCTION

Low back pain (LBP) is defined as the pain that can spread to the lower extremities in the region between the lower border of the scapula and the hip (1). Low back pain is one of the most important causes of morbidity in all countries, and 80%-85% of people have low back pain in at least one period of their lives (2). It is reported that LBP impairs the ability to perform daily activities. In addition to health-related effects, it affects productivity and labor force and leads to socio-economic losses (3,4). Therefore, a multidisciplinary approach is required to resolve low back pain (5).

It is thought that people who report more disability in their daily life will have lower physical activity level. Therefore, it is recommended that patients with LBP need to increase physical activity to accelerate recovery and reduce disability. In acute LBP, it is recommended to do physical activity and avoid from bed rest, while in chronic LBP, cognitive therapy and exercise are adviced as well as passive approaches (6). Chronic low back pain is one of the main causes of functional disability. In a study, a statistically significant ($p < 0.05$) relation was found between low back pain and ODI (7).

While the prevalence of low back pain in elderly people is 36%, prevalence in young people is 12% (8). The prevalence of low back pain in young people increase over the time. the most important reason for this increase is the adoption of a sedentary lifestyle (9).

Physical activity is defined as activities that occur through energy consumption by using our muscles in daily life. The heart and respiration rate increase by physical activity and resulting in fatigue at different intensities. Each individual performs physical activity to maintain their life and physical activity level varies from person to person (10). In summary, all activities that increase energy expenditure are defined physical activity (11).

The amount of energy that required to complete an activity is calculated in kilojoules or kilocalories. To express expenditure energy during physical activity is used kilocalories/days or kilocalories/weeks. Energy expenditure during total physical activity describe the sum of the energy consumed during sleeping, working and leisure activity (12).

According to the World Health Organization (WHO), physical inactivity is the fourth leading risk factor for global mortality at the present time. As a result, physical inactivity has major effect for the general health of the world's population (13).

Long-term physical inactivity disrupts functional capacity. Individuals who engage in regular physical activity have better muscle strength, body balance, aerobic capacity, metabolic and immunological functions (14). It has been reported that physical activity can reduce coronary heart diseases by 9.3%, Type 2 diabetes by 11.5%, breast cancer by 16.3%, and colon cancer by %16.6. In addition, it is well-known that physical activity increases strength, flexibility and self-esteem as well as strengthening the bones and muscles (15).

World Health Organization (WHO) has recommended that adults aged 18-64 should do at least 150 minutes of moderate intensity aerobic activity throughout the week in order to reduce the risk of depression, improve bone health and maintain cardiorespiratory and muscular fitness (13).

Health-related behavior in early life has an important factor on individuals' lifestyle in the future. Because physical activity level of young people affects the incidence of many preventable diseases that constitute a problem in older ages, such as low back pain (16).

Therefore it can be said that increase in the physical activity levels of young people will contribute to the formation of a healthier society in the following years. LBP is one of increasing healthy problems in young people. For this reason, it is important to prevent low back pain and to determine causal factors of LBP. The aim of this study was to determine the relationship between physical activity level and physical disability in young individuals with low back pain.

2. MATERIAL AND METHODS

This research is a descriptive study designed for determining the relationship between physical activity level and physical disability in young individuals with low back pain. To determine the sample size of the study was applied the formula and the sampling was calculated as 240 (17). 283 people participated, and total of 260 (131 females, 129 males) people completed the study. Written permission was obtained from the university where the research was conducted. The study was conducted in compliance with the Helsinki Declaration; all participants were informed and written consent was obtained. After the approval of the Ethics Committee of *** the research was applied to the participants (Reference No= 268-71). Volunteers who were between 18-24 age without neurodevelopmental and rheumatic problems causing low back pain, have experienced low back pain in the last 6 months and signed informed consent form were included in the study. Participants who undergone surgery in the last one year, who had any cardiopulmonary, neurological or orthopedic anomaly that hinders physical activity, and who was pregnant were excluded in the study. Sociodemographic characteristics such as age, gender of the subjects were obtained with a questionnaire that was prepared by the researchers (Table 1). In addition, physical disability caused by low back pain was assessed using the Oswestry disability index (ODI) and the physical activity level was evaluated with the International Physical Activity Questionnaire-Short Form (IPAQ-SF).

The IPAQ-SF was implemented to assess physical activity levels. The short form consists of seven questions. This form provides information about time spent in walking, moderate, severe activities, and sitting in the last week. The calculation of IPAQ-SF includes the sum of the duration (minutes) and activity frequency (days) of walking, moderate intensity activity, and severe activity, seperately. Multiples of the metabolic equivalent (MET) are widely used to prescribe exercise intensity and quantify the energy cost of physical activities. A growing body of empirical evidence, however, suggests the standardized 1-MET value, represented by a resting oxygen uptake (VO2) of 3.5 mL/kg/min. The energy required for these standardized MET values is calculated using the MET-minute score as follows:

Severe Physical Activity = 8 MET, Moderate-Severe Physical Activity = 4 MET, Walking = 3.3 MET, Sitting = 1.5 MET.

Three levels of physical activity is used to categorize a work done throughout week. These categories are formed by calculating MET values which are shown above.

There are three levels of activity:

Category I: Inactive: <600 MET-min / week

Category II: Minimum active: >600 - 3000 MET-min / week

Category III: Active: <3000 MET-min / week (18).

The Oswestry Disability Index (ODI) was used to determine the disability degree of LBP. The ODI consists of a total of 10 items measuring the severity of pain, personal care, lifting, walking, sitting, standing, social life, sleeping, traveling and pain. Each item is scored

from 0 to 5. As the ODI's total score increases, the disability level increases (19). In this study, total disability score was used. The maximum score is calculated 50 points.

Statistical Analysis

Statistical analyses were performed with the use of IBM SPSS (IBM SPSS Statistics for Windows, Version 11.5. Armonk, NY: IBM Corp). It was checked if data had normal distribution through the Kolmogorov-Smirnov test. Pearson's rank correlation coefficients (r) were calculated to determine the association between ODI score and the IPAQ-SF. We used the Independent samples t-test and One way Anova to compare independent groups data. The significance level of all data was accepted as $p < 0.05$.

3. RESULTS

A total of 260 people were enrolled in the study (mean age 20.3±1.1 years; mean body mass index 22.03±2.97 kg/m2). Participants' ODI score average was 6.32±5.48 and IPAQ total score was 2593.0±1937.12. Participants' sociodemogrophic characteristics were summarized in Table 1. A weak significant correlation was founded between the ODI and the IPAQ-SF ($r = -0.142$; $p < 0.05$) (Table 2). There was no significant difference the ODI scores according to physical activity levels (Table 3). The ODI score of females was significantly higher than males' score (Table 4). There was no significant difference ODI score according to BMI, whereas it was found a significant difference between IPAQ total score and BMI (Table 5).

Table 1. Sociodemographic characteristics

Variables	**N**	**%**
Sex		
Male	129	49.7
Female	131	50.3
According to IPAQ-SF		
Inactive	41	15.7
Minimally Active	127	48.9
Active	92	35.4
Body Mass Index (BMI)		
Underweight	22	8.5
Normal weight	188	72.3
Overweight	45	17.3
Obese	5	1.9

Table 2. The relationship between the Oswestry disability index and IPAQ

	Oswestry Disability Index
IPAQ (Total)	
r	-0.142
p-value	**0.012 ***

Pearson correlation coefficent was applied

Table 3. The relationship between Physical acitivity levels (according to IPAQ-SF) and the Oswestry disability index

	Oswestry Disability Index
	N
Physical Activity Levels	
Inactive	41 5.0±5.02
Minimal Active	127 6.0±5.85
Active	92 5.0±5.10
p-value	0.174

One way Anova was applied

Table 4. Compairing result of the Oswestry disability index and IPAQ-SF scores according to sex

		N	ODI score		IPAQ-SF	
			Mean±SD	**p**	**Mean±SD**	**p**
Sex	**Female**	131	7.5±6.0	**0.0001***	1824.8±1487.0	**0.0001***
	Male	129	5.1±4.6		3189.1±2013.0	

Independent Samples "*t*" *test was applied*

Table 5. Compairing result of the Oswestry disability index and IPAQ-SF scores according to Body Mass Index

		ODI score	IPAQ score
	N		
Body Mass Index			
Underweight	22	3.0±7.96	1926.0±1250.91
Normal weight	188	5.0±5.39	2445.0±1934.79
Overweight	45	6.0±4.66	3339.0±1923.47
Obese	5	7.5±3.18	3866.50±2113.08
p-value		0.697	**0.000***

One-way Anova was applied

4. DISCUSSION

In this study, we investigated the relationship between physical activity levels and physical disability severity in young individuals with low back pain. Also we analysed physical activity levels according to demographic factors in all participants.

Previous studies report similar results to this study concerning the relationship between physical activity and physical disability caused by low back pain. A study in which assess physical activity level with using acceloremeter, reported that increased physical activity levels reduces low back pain (3). Another study using the same method of measurement have stated that there is a moderate correlation between physical activity and disability among persons with chronic LBP (6). Although there was a weak correlation in this study, similar results were found. This situation may be due to the fact that the data obtained with IPAQ-SF are more subjective than the accelerometer.

In a study, physical activity level of young people was investigated and was determined 15% were inactive, 68% minimally active, and 18% active of them (20). In according to the results of this study, 15.7% of the participants were inactive, 48.9% were minimally active, and 35.4% were active. This outcomes supports Savcı et al. study. Massie et al. (2002) reported that men the time of their total participation to physical activities was higher than women (21). Another study was stated that men can maintain their physical activity habits more than women and carry these habits into their adulthood (22). Similar to this studies, we found that males become more engaged with physical activity than females.

Low physical activity level and body mass index (BMI) were reported to be related to variety of diseases. Additionally, the relationship between physical activity and low back pain was detected in many studies (23,24,25).

In literature, a negative relationship was found between BMI and physical activity level. Accordingly, obese individuals were less active than normal weight individuals in some studies. (26,27). However, there was no significant relationship between BMI and physical activity level in others (28,29) and also we found that physical activity levels of obese and overweight individuals were significantly higher than normal weight individuals. Similarly, in a study which is conducted Kale (30) was found a positive relationship between BMI and physical activity level. We belive that the reason for higher physical activity levels of students with high BMI may be caused by the desire to provide weight control.

It has been emphasized in previous studies that physical disability caused by low back pain is higher among people who have a sedentary lifestyle (31) and females' oswestry disability index score was higher than males (32). Participants in our study were student in a university and they have attended to the lessons for five days in a week. So a large majority of the participants were inactive. Likewise, there was a statistically significant relationship between IPAQ and ODI scores in our study.

The present study has some limitations. Firstly, a limited number of people were included in this study, since the subjects were recruited only from a university faculty. Secondly, people from different age group were not included in this study. So, homogeneous distribution of ODI score was not achieved. Therefore, these results cannot be generalized for every part of society.

5. CONCLUSİON

According to the results of this study, it was understood that increasing the physical activity level in young people was effective in preventing low back pain but this effect was weak. We consider that the awareness of young people must be raised with regard to the significance of increasing their physical activity levels. We hope to conduct a study that will examine the relationship between physical activity and physical disability caused by low back pain in all age groups in consideration of socioeconomic characteristics and other parameters that may affect low back pain.

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