



The Relationship between Exercise and Reducing Musculoskeletal Pain

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ABSTRACT

Aim: Chronic pain is defined as pain beyond normal tissue lasting for 12 weeks or more. It contributes to disability, anxiety, depression, sleep disturbances, poor quality of life, and healthcare costs. Although, the treatment choice for chronic pain maybe included recommendations for rest and inactivity, exercise may have specific benefits in reducing the severity of chronic pain, as well as more general benefits associated with improved overall physical and mental health, and physical functioning. Therefore, this study aimed to assess the relationship between exercise doing and musculoskeletal pain.

Methods and Instruments: This descriptive study was conducted among academic people working in Tarbiat Modares University from Jan to Apr 2020. The volunteer subjects were entered into this study after being informed about the aim and procedure of the study and signing the consent form. In this study, the relationship between doing exercise and musculoskeletal pain was investigated.

A researcher -made questionnaire based on the objectives of the study as well as a demographic characteristics questionnaire were used to collect data. In the objective based questionnaire, the participants were asked about their exercise doing and musculoskeletal pain. The response options to the questions were as Yes or No. Finally, the data were entered into SPSS version 26 software and statistically analyzed using descriptive analysis as frequency/percent and analytical analysis as chi-square test.

Findings: Totally 93 participants with mean age of 36.15±11.42 years old including students (41.9%), employees (54.7%) and professor (3.5%) were participated in the study. Furthermore, 41.4% of the participants were men and 58.6% were women. According the results, there was a significant relationship between exercise and reduction of musculoskeletal pain ($p < 0.0001$) Mann Whitney's test showed that there was a significant relationship between gender and exercise activity (P value= $< .001$), which was higher in men than women.

Conclusion: This study showed that the participants who did exercise they were less suffering from musculoskeletal pain.

Keywords: Exercise, cChronic Musculoskeletal Pain, Relationship

Introduction

Recent estimates claim that chronic pain affects 1.5 billion people worldwide, and these figures are steadily on the rise^[1]. In the U.S., chronic pain is thought to affect over 116 million adults^[1] that is more prevalent than combined diabetes, cancer, and heart disease^[2]. As a result, chronic pain remains a pervasive medical problem consuming a vast amount of health care resources. In European countries, national health care and socioeconomic costs associated with chronic pain is totally about billions of dollars a year^[3, 4], whereas treatment costs in the U.S.

can rise up to \$635 billion dollars annually^[2] imposing a substantial economic burden on healthcare systems and society.

Increasing evidence cites exercise as an accessible, cost-effective, and viable therapeutic modality for the treatment of nearly all types of chronic pain conditions^[5, 6]. Regular physical activity and exercise improve many aspects of a person's general health, including cardio respiratory function, mental health, and pain^[7, 8]. In general terms, physical activity can include various tasks of daily living, such as work, mobility, leisure, and

recreational activities. These are activities that require musculoskeletal mobility and energy expenditure. More specifically, exercise is a subset of physical activity, and is defined as structured activity with a goal of improving physical performance and/or health^[9].

Common forms of exercise that are studied for the relief of pain include running, walking, resistance training, aquatic exercise, and Tai Chi. Exercise has been found to be effective in relieving pain and benefiting patients' daily physical function in various chronic musculoskeletal pain disorders, including chronic neck pain^[10, 11], osteoarthritis^[11, 12], fibromyalgia^[13], and chronic low back pain^[11, 14]. A dual effect is thus realized for patients with chronic pain because aerobic exercise reduces pain and fatigue as well as improves peak oxygen uptake, health-related quality of life, and physical fitness^[15, 16]. Physical activity has been shown to be associated with decreased symptoms of depression and anxiety. Further, it has been suggested that exercise could be particularly advantageous in the context of chronic pain morbid with psychiatric illness^[17, 18]. This is particularly important considering that levels of physical activity are inversely correlated with depression symptoms in fibromyalgia patients^[19]. Although overall evidence shows exercise to be at least moderately beneficial in chronic pain^[20].

To our the researchers'; experiences, the employees and students in Tarbiat Modares University are low physical active Therefore, this study aimed to investigate if there is any correlation between exercise and chronic musculoskeletal pain among this target group.

Methods and Instruments

This descriptive study was conducted among academic people working in Tarbiat Modares University from Jan to Apr 2020. In this study, the relationship between doing exercise and musculoskeletal pain was investigated.

Criteria for entering the study included having academic background such as student, employee or professor, aged 18 years old and older. The exclusion criteria were suffering from any problem prevent them to exercise or not being satisfied to be studied.

A researcher -made questionnaire based on the objectives of the study as well as a demographic characteristics questionnaire were used to collect data. In the objective based questionnaire, the participants were asked about their exercise doing and musculoskeletal pain. The response options to the questions were as Yes or No. Finally, the data were entered into SPSS version 26 software and statistically analyzed using descriptive analysis as frequency/percent and analytical analysis as chi-square test .

All ethical principals were considered in this study. The objective and procedure of the study were explained to the potential participants and if they were satisfied to be studied they were entered into the study.

Findings

Totally 93 participants with mean age of 36.15 ± 11.42 years old were participated in the study. Figure 1 shows that 41.9% of the participants are students, 54.7% are employees and 3.5% are professors. Furthermore, 41.4% of the participants are men and 58.6% are women. Table 1 shows the rest demographic characteristics of them.

Table 2 shows a significant relationship between exercise and reduction of musculoskeletal pain ($p < 0.0001$). The Chi-square test showed that there was no statistically significant difference between exercise and marital status ($P = 0.456$). Mann Whitney's test showed that there was a significant relationship between gender and exercise activity ($P \text{ value} = < .001$), which was higher in men than women. However, there was no significant difference between gender and education ($P \text{ value} = 0.90$).

Table 1) Demographic characteristics of the participants

Variables	Number	Percent (%)
Gender		
Female	42	45.2
Male	51	54.8
Occupation		
Student	36	38.7
Employee	47	50.5
Professor	3	3.2
Education level		
Diploma	6	6.5
Postgraduate	1	1.1
Bachelor	33	35.5
Master	34	36.6
Ph.D.	17	18.3
Marital status		
Single	43	46.2
Married	46	49.5

Discussion

The results of the present study, which were designed to determine the relationship between exercise and reducing musculoskeletal pain, indicate that there was significant relation between exercise and reducing pain. The participants who did more exercise stated more improved pain after exercise. Furthermore, participants with low back pain experienced less back pain than those with neck, shoulder, knee, ankle, and pelvic pain. Therefore the participants who have daily physical activity have more pain relief. From these findings, it can be concluded that common exercises might be effective on reducing pain. In other studies, however, most researchers have looked at exercise program to treat chronic pain. In this regard, research conducted by Polaski, et al in 2019 with the aim of the effect of exercise on chronic pain [21] revealed a significant positive correlation between exercise duration and analgesic with neck pain. Multiple linear regression modeling of these data predicted that increasing the frequency of exercise sessions per week is most likely to have a positive effect on

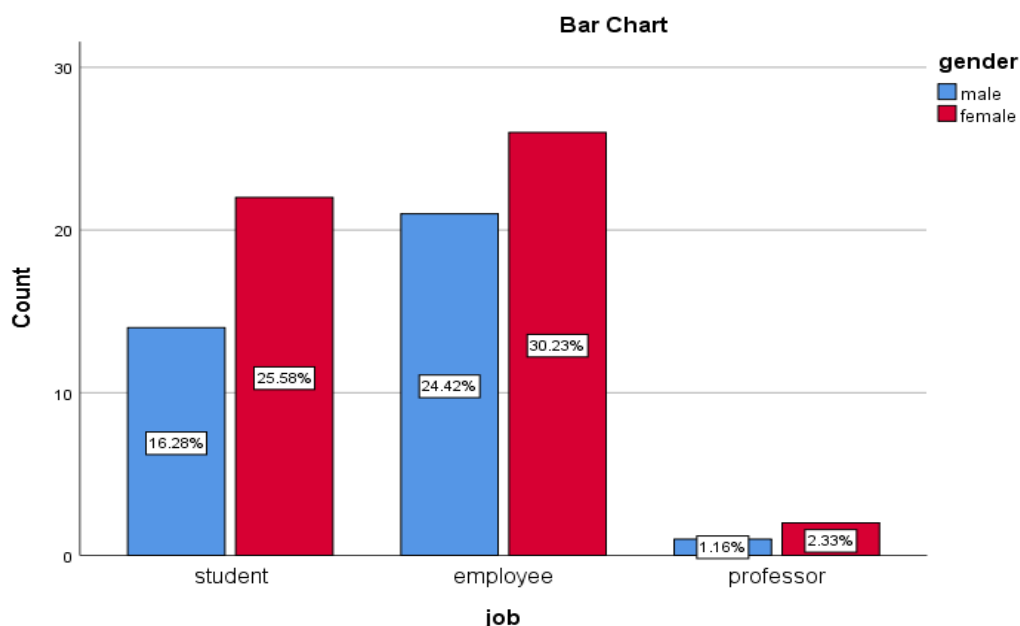


Figure 1) Gender and job chart

Table 2) Relationship between doing exercise and musculoskeletal pain

Questions	Do you do exercise?		P Value
	Yes N (%)	NO N (%)	
Does exercise reduce the pain of your neck?			
Yes	50 (89.3)	7 (25.0)	
No	6 (10.7)	21 (75.0)	<0.0001
Does exercise reduce the pain of your back?			
Yes	57 (91.9)	8 (30.8)	
No	5 (8.1)	18 (69.25)	<0.0001
Does exercise reduce the pain of your knee?			
Yes	55 (96.5)	4 (14.8)	
No	2 (3.5)	23 (85.2)	<0.0001
Does exercise reduce the pain of your shoulder?			
Yes	56 (96.6)	6 (21.4)	
No	2 (3.4)	22 (78.6)	<0.0001
Does exercise reduce the pain of the wrist?			
Yes	57 (91.9)	2 (9.1)	
No	5 (8.1)	20 (90.9)	<0.0001
Does exercise reduce the pain of the hip?			
Yes	52 (96.3)	9 (29.0)	
No	2 (3.7)	22 (71.0)	<0.0001
Does exercise reduce the pain of the ankle?			
Yes	53 (85.5)	5 (22.7)	
No	9 (14.5)	17 (77.3)	<0.0001

chronic pain patients .Overall, the analysis of the existing literature demonstrated insufficient evidence for the presence of effects of exercise in relation to analgesia. The results of this study are consistent with the results of the present study^[21]. Geneen and co-workers in 2017 argued that there was relationship between physical activity and reduced severity of pain, improved physical function, and improved both psychological function and quality of

life^[22]. However, these results were not found in all studies. The inconsistency could be due to the quality of the studies or because of the mix of different types of physical activity tested in the studies. Additionally, participants had predominantly mild-to-moderate pain, not moderate-to-severe pain. However, as a conclusion, it could be said that physical activity and exercise may improve pain severity as well as physical function and quality of life.^[22]

This study had limitations, the most important of which were lack of exact awareness about the severity and duration of exercise. Furthermore, not being aware about the exact location and severity of the chronic pain is probably the other limitation. However, the data in this research has been collected through self reporting that might be influence the results and could be another limitation. At the end , it should be verified that exercise could improve chronic musculoskeletal pain.

Conclusion

Based on the results of this research, it is recommended that exercise could be as a way to reduce patients 'pain along with other treatments in order to improve the severity of patients' pain and disability.

Therefore, for people with chronic pain, exercise is also recommended as a non-pharmacological , easily available and lower cost way to relieve pain.

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Author contribution: FMB designs and conducts the study, analyse the data, and read the manuscript.

MGH read and approve the manuscript.

Conflict s of Interest: There is no conflicts of Interest.

Ethics Permission: All Ethical principal were considered in the study.

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