



## Effect of Exercise Training on Low Back Pain in Farmers; A Case Study of Aq-Qala, Golestan Province

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### ABSTRACT

**Aims** one of the most common musculoskeletal disorders among farmers is low back pain. The aim of this study was to investigate the effect of corrective exercise training on low back pain disorder among farmers.

**Materials & Methods** This research is a semi-experimental study that was conducted on farmers in Aq-Qala, Golestan Province, Iran in 2017. The statistical population of this study was all farmers in the central part of the city of Aq-Qala. The sample consisted of 100 farmers in the central city of Agh-Ghala were randomly divided into two groups, intervention (n=50) and control (n=50) groups. The instrument of research was Nordic questionnaire. The intervention group participated in an 8-session sports training program. Chi-square and McNemar tests were used and the collected data were analyzed by SPSS 18.

**Findings** The prevalence of back pain among farmers in both intervention and control groups was 56% and 60%, respectively. There was a significant difference between the percentage of low back pain in the intervention group before and after the training of corrective exercise training (p=0.001). This difference was not significant in the control group (p=0.879). The intervention in the intervention group reduced the back pain by 24%.

**Conclusion** Intervention of corrective exercise training can reduce the prevalence of low back pain among farmers.

**Keywords** Lower Back Pain; Exercise; Farmers; Health Education

### CITATION LINKS

[1] Quality of life assessment in elderly people that experiencing low back pain [2] Medical-surgical nursing: Health and illness perspectives [3] Prevalence of one-year back pain in Iran: A systematic review and meta-analysis [4] Musculoskeletal disorders self-reported by dentists in Queensland, Australia [5] A survey on prevalence of musculoskeletal disorders and associated risk factors among Sabzevarian farmers in 2011 [6] Occupational injuries and illnesses among Washington State agricultural workers [7] Model development for health promotion and control of agricultural occupational health hazards and accidents in Pathumthani [8] Low back pain and musculoskeletal symptoms among Kansas farmers [9] Prevalence of musculoskeletal disorders and its associated Factors among farmers and workers: A cross-sectional study from Agh Ghala, Golestan, Iran [10] Prevalence of Musculoskeletal Disorders and associated factors among Adults living in Aq Qalaian rural, Iran [11] Prevalence rate of low back pain and its relationship to demographic factors, body mass index, and education in ergonomic principles among rural men, AqQala city, 2016 [12] High risk pregnancy e-book: Management options-expert consult [13] The effect of exercise program on low back pain preventive behaviors in pregnant females referred to health centers of Karaj [14] Physical therapy for pregnancy-related low back and pelvic pain: A systematic review [15] Effects of a stability ball exercise programme on low back pain and daily life interference during pregnancy [16] Posture assessment methods in occupational ergonomics [17] Epidemiology of low-back pain and its association with occupational and personal factors among employees of Hamadan province industries [18] Work-related injuries and diseases of farmers in Korea [19] Postural deviations from chronic low back pain and correction through exercise therapy [20] The effect of corrective exercises on musculoskeletal disorders of Khoramabad workers [21] Effectiveness of dynamic muscle training, relaxation training, or ordinary activity for chronic neck pain: Randomised controlled trial [22] The effect of eight weeks corrective exercise with ergonomic intervention on musculoskeletal disorders among loabiran industry workers

## Introduction

Back pain as a musculoskeletal disorder has a high incidence of up to 80% in the world so that people have experienced back pain throughout their lives [1]. In the United States, 18 million people each year come to the doctor's office to treat pain in the waist [2]. Lower back pain as a common problem in human societies imposes high socioeconomic, psychological and social costs on both individuals and society [3].

One of the important sectors in the country's production sector is the agricultural sector. In addition to the role of job creation, the comprehensive attention to this sector can contribute to the economic prosperity, independence and self-sufficiency of the country and the country's food security [4]. One of the important factors that can greatly increase farmers' productivity and productivity, as well as reduce the cost of musculoskeletal disorders, is to provide their occupational safety and health [4]. In today's world, almost half of the workforce is employed in the agricultural sector; however, the agricultural sector has been neglected due to the concentration of professional health professionals in the industry. Most victims are farmers in developing countries [5]. In a Demerse's study, insurers' compensation payments for Washington state farmers were 50% higher than non-farm workers [6]. The farmers are known as hard-working, so they are more prone to musculoskeletal disorders. The results of the research show that pain in the regions of the lower back, shoulders, arms, hands and diseases of cumulative trauma disorder (CTD) is the most common symptom that harms the farmers. These injuries can lead to early disability and, consequently, it has a negative impact on people's income and national income [4, 7]. The prevalence of low back pain in farmers (31%) was significantly higher than the general population (18.5%) [8].

Also, in many studies in Iran, the prevalence of musculoskeletal disorders in back pain among farmers has been reported between 32% and 46.5% [9-11].

Preventive behaviors of the back pain include keeping the spine fit, preventing overweight and exercising appropriately [10].

Daily exercise for the waist can enhance the stretching of the abdominal muscles while standing, bending, and swirling movements to the sides [12]. In the meantime, the results of various studies indicate that the effect of the exercise program on reducing pain due to low back pain [13].

However, there was no strong evidence of the effect of exercise on low back pain in another study that examined the effect of exercise on back pain in various studies [14], which contradict the results of further research in this field emphasizes.

According to a large number of people employ in the agricultural profession, as well as the high

prevalence of low back pain among farmers, and the lack of attention paid by the health sector to training methods for the prevention of low back pain among farmers, such research contributes to improving the livelihood of farmers [4].

The aim of this study was to investigate the effect of corrective exercise training on low back pain disorder among farmers.

## Materials and Methods

This research is a semi-experimental study that was conducted on farmers in Aq-Qala, Golestan Province, Iran in 2017. The statistical population of the study was all farmers in the central part of the city of Aq-Qala. The sample size was considered based on a similar study by Yan *et al.* 50 people [15]. The inclusion criteria were rural farmers who no had to limit exercise and having a desire to participate in the study, respectively. Exclusion criteria included: Lack of exercise training was attending meetings.

Of the 40 villages covered by the central part of Aq-Qala, 5 villages were randomly selected, then, 20 people were selected from each village. The selection of samples in each village was as follows:

In the villages with a home for health, the right side first health center (When leaving the health center) and in the villages lacking health center, the first home of the right side main road the village was selected 20 Samples.

Fifty farmers were randomly assigned to the intervention group (n=50) and the control group (n=50).

After obtaining informed consent, the samples were assessed using a Nordic questionnaire which has a high reliability and validity [16]. In this questionnaire, focusing on different anatomical areas of the body, causes musculoskeletal disorders of the organs to be selected by the respondent, in such a way that the person is asked to answer the question: "Did you have distressed or in trouble in these areas in last 12 months, and seven days ago" or "Did low back pain causes you left her job or her inability to do work [10].

Exercise training sessions were practiced by physical education instructor simply and comprehensively in 8 sessions and only in the intervention group. The exercises were designed based on the ability of each person and the basics of exercising, including intensity of exercise, gradually increase, and duration.

The general framework of the exercise program included warming up and light stretching from 5 to 10 minutes, tensile training 20 to 25 minutes, and returning to the initial 5 to 10 minutes. The exercise program of the waist region was a flash training exercise with emphasis on strengthening the abdominal muscles and back extensors. After 2 months, the Nordic questionnaire was completed again and the results were compared before the

intervention in the two groups (in the present study only the data for the last 7 days were analyzed). The questionnaire was completed in person by the researcher.

Chi-square and McNemar tests were used and the collected data were analyzed by SPSS 18 software.

## Findings

The mean age of the participants in the intervention group was 40.1±8.15 and 41.84 years-old in the control group. The demographic characteristics before the intervention showed that there was no significant difference between the two groups (Table 1).

The intervention in the intervention group reduced the back pain by 24%. The exercise program reduced significantly the prevalence of low back pain in the intervention group (Table 2).

**Table 1)** Comparison of demographic characteristics of the intervention and control group before intervention (The numbers in parentheses represent percent, n=50 in each group)

Variable	Intervention group	Control group	p-value
<b>Groups of age (years)</b>			
30-40	18 (36.0)	17 (34.0)	0.5
41-50	29 (58.0)	31 (62.0)	
51-60	3 (6.0)	2 (4.0)	
<b>Level of education</b>			
Illiterate	7 (14.0)	8 (16.0)	0.6
Elementary and guidance	43 (86.0)	42 (84.0)	
<b>Learning the principles of ergonomics</b>			
Yes	3 (6.0)	2 (4.0)	0.62
No	47 (94.0)	48 (96.0)	
<b>Low back pain</b>			
Yes	28 (56.0)	30 (60.0)	0.59
No	22 (44.0)	20 (40.0)	

**Table 2)** Comparison of prevalence of low back pain before and after intervention in two intervention and control groups (The numbers in parentheses represent percent, n=50 in each group)

Variable	Before Intervention		After Intervention		McNemar test
	Yes	No	Yes	No	
<b>Low back pain</b>					*P-value
<b>Intervention group</b>	28 (56.0)	22 (44.0)	16 (32.0)	34 (68.0)	0.001
<b>Control group</b>	30 (60.0)	20 (40.0)	29 (58.0)	21 (42.0)	0.879

## Discussion

The aim of this study was to investigate the effect of corrective exercise training on low back pain disorder among farmers.

In this study, the prevalence of back pain among farmers in both intervention and control groups were 56.0% and 60.0%, respectively, indicating a high prevalence of low back pain among farmers. The high prevalence of low back pain in farmers has been reported in studies by Izadirad [10], Ahmadi *et al* [17], Izadirad *et al.* [11] and Lee and Lim [18].

This phenomenon may be due to the nature of the farmer's occupation or the wrong position during work. One of the ways can be effective at discounting is proper training for the farmer's posture during work as well as exercise [19]. The results of the study of Hasanvand *et al.* [20] indicated a positive effect of 8 weeks of corrective exercises on pain relief and musculoskeletal problems of workers in all nine areas of the waist.

In the present study, the exercise program reduced significantly the prevalence of low back pain in the intervention group. The reasons for this problem were the duration of treatment, the severity and frequency of exercise. The study of Viljanen *et al.* stated that the exercises should be sufficient enough tight and continuous to be effective in reducing skeletal disorders [21].

Regardless of the control group, corrective exercises reduced low back pain in the intervention group, which was consistent with Hasanvand *et al* [20] and Rahnama *et al.* studies [22]. However, in a study by Stuge *et al.* [14] that examined the effect of exercise on back pain in various studies, there was no strong evidence of the effect of exercise on low back pain.

This result seems to be due to the different types of exercise activities, the duration, intensity and frequency of exercise exercises in various studies.

Overall, corrective exercise training is recommended to reduce the prevalence of low back pain disorders. Also, since musculoskeletal disorders, including work-induced back pain, can be prevented, designing an appropriate intervention program with an emphasis on the removal of inappropriate postural dysfunction and reducing mechanical stress can play an important role in reducing this disorder. The present study is not defective, due to ethical considerations, only interested farmers and those who were willing to participate were included in the study. Self-report questionnaire and subjective evaluation based on the participants' statements and the lack of use of objective criteria regarding the effect of exercise program training on other weaknesses of the present study.

## Conclusion

The prevalence of low back pain in farmers is high and corrective exercise training is effective in reducing the prevalence of low back pain.

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Assistant researcher/ Statistical analyst/ Discussion author (25%); Delshad M.M. (Third author), Assistant researcher/ Discussion author (25%)

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