

# Improving the health of people with diseases of the musculoskeletal system through physical therapy

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## ABSTRACT

**Aim:** To investigate the effectiveness of physical therapy in improving the health of patients with diseases of the musculoskeletal system.

**Materials and Methods:** The research, conducted in 2022–2024, involved 105 patients with musculoskeletal disorders. Research methods were bibliosemantic, medical and sociological, and statistical.

**Results:** It has been found that only 24.8 % of the patients engage in physical activity daily to maintain the health of the musculoskeletal system, 24.8 % rarely, and 14.3 % do not engage at all. It has been found that among the physical therapy means used by the patients to maintain the health of their musculoskeletal system are exercise machines – 32.4 %, therapeutic physical education – 26.7 %, therapeutic massage – 16.2 %, and yoga – 8.6 %. The patients rarely use manual therapy (7.6 %) and Kinesio taping (5.7 %). Factors limiting access to physical therapy means for the patients in their region include a lack of reliable information about the availability and affordability of physical therapy means – 48.6 %, financial difficulties – 30.4 %, and remoteness of healthcare facilities – 8.6 %. 96.2 % of the patients indicated they needed advice and information on physical therapy to strengthen their musculoskeletal system.

**Conclusions:** Effective ways to increase the use of physical therapy for patients with diseases of the musculoskeletal system include intensifying the information campaign on therapeutic exercise and other physical therapy means in the media, expanding the network of rehabilitation facilities, and reducing the cost of rehabilitation services.

**KEY WORDS:** health, diseases of the musculoskeletal system, musculoskeletal disorders, physical therapy, patients

Wiad Lek. 2025;78(8):1538–1543. doi: 10.36740/WLek/209506 DOI

## INTRODUCTION

The results of the World Health Organization's Global Burden of Disease study (2019) show that disorders of the musculoskeletal system are the second leading cause of disability worldwide [1]. In Ukraine, diseases of the musculoskeletal system increase primary disability by about 0.5 % annually compared to previous years [2, 3]. These diseases lead to a deterioration in health and a decrease in the ability to work, which has significant economic consequences for the state.

The incidence and prevalence of diseases of the musculoskeletal system or supporting motor apparatus among people of different age groups vary significantly. Ukraine is one of the countries with a relatively high level of population aging. While among children, the prevalence of musculoskeletal diseases exceeds the

incidence rate by 2.24–2.36 times, with age (in the older age group), it increases by 4.7 times [4].

According to specialists [5], the most common diseases of the musculoskeletal system (disorders of the supporting motor apparatus) that require physical therapy include arthritis, osteochondrosis, scoliosis, hip dysplasia, injuries of joints, muscles, tendons, and patellar dislocation.

One of the main areas of improving the health of patients with diseases of the musculoskeletal system is physical therapy, which involves a set of measures aimed at reducing the level of disability among the population [6]. According to scientists [7], physical therapy seeks to restore disabled people's health and ability to work; it is carried out in the context of integrative activities of healthcare workers and public health pro-

professionals. Diagnostics and examination of the health status of patients with diseases of the musculoskeletal system involves an examination, collection of medical history, and the use of special tests and measurements. Based on the collected data, possible developments are predicted. Modelled forecasts are used to develop a physical therapy plan for patients. The physical therapy program includes cooperation with the patient and family members, a list of medications, and physical therapy means [8]. Upon completion of the physical therapy course, the effectiveness of rehabilitation achievements is determined, and recommendations are made for a further individualized trajectory for the patient's physical rehabilitation. Patients receive instructions and advice on how to improve their health, physical activity and self-care methods. If necessary, appropriate adjustments are made to the physical therapy plan [9]. At the same time, the study of the patients' opinions and attitudes regarding the effectiveness of physical therapy in the recovery of musculoskeletal disorders is appropriate and relevant.

## AIM

The aim is to investigate the effectiveness of physical therapy in improving the health of patients with diseases of the musculoskeletal system.

## MATERIALS AND METHODS

The research was conducted in 2022-2024 at Zhytomyr Ivan Franko State University and Poltava State Medical University. The research involved 105 patients with musculoskeletal disorders (71 women (67.6 %) and 34 men (32.4 %)). The vast majority of the patients were 18-24 (55.2 %) and 25-44 (26.7 %).

Research methods: bibliosemantic, medical and sociological (survey), statistical. The research was conducted in four consecutive stages. The first stage involved substantiation of the relevance of the chosen topic, determination of the aim, analysis of the literature on physical therapy, its means and effectiveness of their use for patients with musculoskeletal disorders, and selection of appropriate research methods. The second stage provided for the development of the means of conducting a medical and sociological study, the determination of the contingent of respondents, and the development and approval of a questionnaire (18 questions) by the bioethics committee. Questionnaire was assessed by the experts in this field (2 professors and 5 associate professors) and was approved by the Academic Council of Zhytomyr Medical Institute of Zhytomyr Regional Council (Protocol No. 5 dated 03.10.2022).

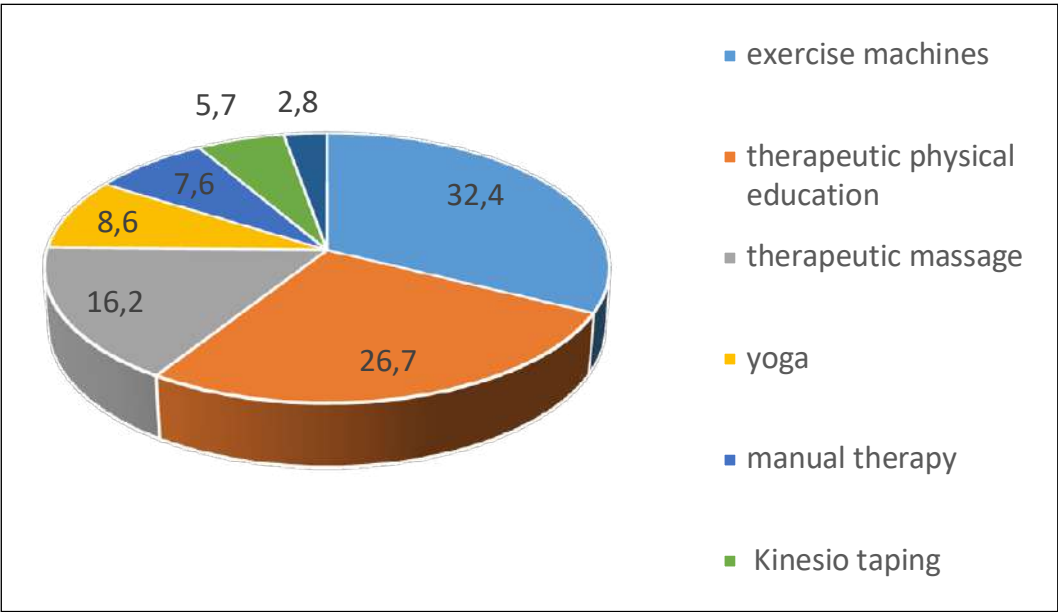
The third stage involved a survey among patients of healthcare facilities ( $n = 105$ ). The survey aimed to study the effectiveness of physical therapy in improving the health of patients with musculoskeletal disorders. Due to the military operations in Ukraine, the survey was conducted remotely using the GOOGLE-FORMS tool. The patient respondents had the opportunity to use the survey materials at the link: [https://docs.google.com/forms/d/1rnl\\_vvwveUXW-WjYjVOsFevlyz-AK-nARiNP3qifJAc/edit?usp=drive\\_web](https://docs.google.com/forms/d/1rnl_vvwveUXW-WjYjVOsFevlyz-AK-nARiNP3qifJAc/edit?usp=drive_web). The questionnaire was anonymous without any references to the authors of the article in the answers. The results were used for scientific purposes only. The survey results were statistically processed on a personal computer using MS Excel. The fourth stage of the research allowed the general conclusions of the work to be formulated. Consent to voluntary participation in the survey was obtained from all the respondents involved in the study. This research followed the regulations of the World Medical Association Declaration of Helsinki – ethical principles for medical research involving human subjects.

## RESULTS

The results of the survey of patients with musculoskeletal system diseases on the availability of knowledge about the importance of physical therapy for maintaining the health of the musculoskeletal system show that 60.7 % of the respondents have a high level of knowledge about the importance of physical therapy for preserving the health of the musculoskeletal system; 19.6 % have an average level of expertise; 19.7 % have an insufficient level of knowledge.

It has been found that only 24.8 % of the respondents engage in physical activity daily to maintain musculoskeletal health, 35.3 % – several times a week, 24.8 % – rarely, and 15.1 % of the respondents do not engage in physical activity at all or extremely infrequently. At the same time, 55.2 % of the respondents use physical therapy means to maintain or improve their health, 35.3 % – rarely, and 9.5 % – do not use it. It has been found that when choosing a type of physical activity, 60.9 % of the respondents take into account the state of their musculoskeletal system; 30.4 % do not take it into account.

Among the physical therapy means used by the patients to maintain the health of their musculoskeletal system, the following were identified: exercise machines – 32.4 %, therapeutic physical education (TPE) – 26.7 %, therapeutic massage – 16.2 %, and yoga – 8.6 %. Rarely, the patients use manual therapy (7.6 %), Kinesio taping (5.7 %), and other means (2.8 %) (Fig. 1). The most effective means of physical therapy used by the



**Fig. 1.** Physical therapy means used by the patients to maintain the health of their musculoskeletal system  
*Picture taken by the authors*

patients to maintain their health include exercise machines training (30.4 %), TPE training sessions (21.9 %), and therapeutic massage (23.8 %).

The factors that limit the accessibility of physical therapy means for the patients in their region include lack of reliable information about the availability and affordability of physical therapy means – 48.6 %, finances – 30.4 %, and remoteness of healthcare facilities – 8.6 %. At the same time, 44.6 % of the respondents believe that accessibility of physical therapy means for the general population can be increased by providing information about these services; 23.8 % of the respondents believe that expansion of the network of healthcare facilities can help; 23.8 % point to the practicality of reducing the cost of services. Moreover, 96.2 % of the patients said they needed advice and information on physical therapy to strengthen their musculoskeletal system. It was also found that 53.3 % of the respondents use apps or online resources to get the necessary advice on maintaining the health of their musculoskeletal system, with the majority (73.3 %) of the respondents using YouTube.

It has been found that more than half (53.3 %) of the patients use additional means to maintain the health of their musculoskeletal system, including orthopedic pillows or mattresses – 21.9 %, and orthopedic insoles in shoes – 7.6 %. Unfortunately, 47.6 % of the patients do not use any additional means to maintain the health of their musculoskeletal system. The reasons that prevent patients from using physical therapy include lack of time (62.9 %), apathy and indifference to their health improvement (16.1 %). The most effective measures to increase public interest in musculoskeletal health and

physical therapy, according to patients, are information campaigns on television, social media and the Internet (57.1 %), organization of thematic events (21.9 %), involvement of celebrities who have overcome their musculoskeletal problems (8.6 %). According to the surveyed patients, the factors that would encourage people to participate more actively in physical therapy programs are providing subsidies and discounts for gym memberships (32.3 %), involving family and friends in active participation in physical therapy programs (24.7 %), meeting people who are actively engaged in physical therapy (19.1 %), and the need to organize health groups (14.3 %).

Answering the question, “What recommendations for strengthening the musculoskeletal system would you give to other people, especially those who face the same problems?” the respondents’ answers were as follows: 44.8 % of the respondents said that regular physical activity is an important way to strengthen the musculoskeletal system; 14.3 % consider it important to visit rehabilitation specialists; 16.1 % called self-belief an important condition for strengthening the musculoskeletal system.

Thus, according to the survey of patients with musculoskeletal problems, most have access to physical therapy in their region. More than half of the respondents said that the most effective measures to increase public interest in musculoskeletal health and physical therapy are information campaigns on television, social media, etc. Almost half of the respondents believe that regular physical activity and visits to rehabilitation specialists are important ways to strengthen the musculoskeletal system.

## DISCUSSION

According to the International Statistical Classification of Diseases, Tenth Revision (ICD-10), Class XIII, it is a musculoskeletal system disease with more than 120 nosologies. Most of them are degenerative and dystrophic diseases, as well as arthropathies and dorsopathies of inflammatory origin [10]. This explains the age-related differences in the structure of this class's incidence and prevalence of diseases. While degenerative and dystrophic diseases are more typical for adults, inflammatory atrophies (mainly rheumatoid) are more common in adolescents and young men. In general, the degenerative and dystrophic diseases group accounts for more than 60 % of the total number of diseases of the musculoskeletal system, and inflammatory arthropathies – about 8 % [11]. The proportion of diseases of the musculoskeletal system in the overall structure of morbidity depending on age is as follows: 0-14 years old –  $1.84 \pm 0.13$  %, 15-17 years old –  $4.84 \pm 0.76$  %, among women aged 18-55 years and men aged 18-60 years –  $5.60 \pm 0.26$  %, women over 55 years and men over 60 years –  $7.56 \pm 0.26$  % [12].

The proportion of musculoskeletal system diseases in the structure of total morbidity also depended on the age of patients, with a peak increase in young people, which was revealed during a detailed study of the health of young men by conscription commissions. The proportion of morbidity of the musculoskeletal system was as follows: 0-14 years old –  $3.41 \pm 0.18$  %, 15-17 years old –  $8.23 \pm 0.58$  %, women aged 18-55 years and men aged 18-60 years –  $5.59 \pm 0.31$  %, women over 55 years and men over 60 years –  $6.21 \pm 0.22$  % [13].

According to experts [14], the actual incidence of musculoskeletal system diseases is much higher due to the category of patients who, after diagnosis and treatment, self-medicated and next visited a doctor several years later when they were already disabled. The average long-term growth rate of musculoskeletal diseases was 0.10 % from 2002 to 2018 and 1.30 % from 2019 to 2022 [15].

In 2002-2018, the incidence of osteochondrosis was  $101.72 \pm 32.77$  per 100 thousand people, and in 2019-2022, respectively,  $105.12 \pm 5.63$ . The average prevalence of osteochondrosis in 2002-2018 was  $331.55 \pm 27.79$  per 100 thousand people and  $361.24 \pm 20.80$  in 2019-2022 [16].

According to scientists [17], diseases of the musculoskeletal system, even in the early stages, negatively affect motor functions, which affects not only the ability to work but also the quality of life of such patients. Ineffective treatment and rehabilitation lead to temporary loss of working capacity and disability. Improving the results of treatment, including physical therapy

means, and improving the quality of life of this group of patients is possible through outpatient support [18].

The treatment of diseases of the musculoskeletal system requires an integrated approach, from diagnosis to rehabilitation. Despite the variety of treatment methods, these diseases often lead to a high level of disability, which reflects both the state of health and the quality of medical and preventive services [19].

Scientists [20] note that physical therapy for patients with musculoskeletal disorders is carried out using active and passive means. Active means of physical therapy include TPE (modern name – kinesiotherapy), including therapeutic swimming, dosed walking, mechanical, hydro, and occupational therapy, home walking skills training, games, tourism, and outdoor recreation. The group of passive physical therapy means includes therapeutic massage, Kinesio taping, manual therapy, etc. [21].

When conducting physical therapy, experts [22] advise taking into account the following aspects: the type of injury, i.e. any abnormality or loss of anatomical or physiological structures and functions in the body, which may be the result of injury, disease or other factors; the nature of the impairment that occurs as a result of the injury and is defined as the loss or restriction of the ability to carry out daily activities within the limits considered normal for human society. Impairment of life-sustaining activities may include such aspects as motor limitations, pain, inability to perform self-care, etc. Taking these aspects into account allows us to assess the severity of the musculoskeletal disorder and develop individualized rehabilitation programs for patients.

## CONCLUSIONS

It has been found that diseases of the musculoskeletal system are an important social problem that significantly affects patients' ability to work and their quality of life. Ineffective treatment and a lack of physical therapy lead to temporary loss of working capacity and disability, which is accompanied by significant economic losses for the state and patients.

It has been found that only 24.8 % of the patients engage in physical activity daily to maintain musculoskeletal health, 35.3 % – several times a week, 24.8 % – rarely, and 15.1 % do not engage in physical activity at all or extremely infrequently. At the same time, 55.2 % of the respondents use physical therapy to maintain or improve their health, 35.3 % – rarely, and 9.5 % do not use it at all.

It has been found that among the physical therapy means used by the patients to maintain the health of

their musculoskeletal system are exercise machines – 32.4 %, therapeutic physical education (TPE) – 26.7 %, therapeutic massage – 16.2 %, and yoga – 8.6 %. Rarely do patients use manual therapy (7.6 %), Kinesio taping (5.7 %), and other means (2.8 %). The factors that limit the availability of physical therapy means for the patients in their region include a lack of reliable information about the availability and affordability of physical therapy means – 48.6 %, financial difficulties – 30.4 %, and remoteness of medical facilities – 8.6 %. Moreover, 96.2 % of the patients said they needed advice and information on physical therapy to strengthen their musculoskeletal system.

The patients consider information campaigns (57.1 %), organization of thematic events (21.9 %), and involvement of celebrities who have overcome their musculoskeletal problems (8.6 %) to be the most effective measures to increase public interest in musculoskeletal health and physical therapy. At

the same time, 44.8 % of the patients are convinced that regular physical activity is an important way to strengthen the musculoskeletal system; 14.3 % consider it important to visit rehabilitation specialists; 16.1 % called self-belief an important condition for strengthening the musculoskeletal system.

Given the above, effective ways to increase physical therapy means for patients with musculoskeletal diseases are intensifying the information campaign on therapeutic exercise and other physical therapy means in the media, expanding rehabilitation facilities, and reducing the cost of rehabilitation services.

## PROSPECTS FOR FURTHER RESEARCH

It is planned to develop a physical therapy program for patients depending on their musculoskeletal disorders based on the use of motor activity equipment and test its effectiveness in practice.

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*The study was carried out according to the plan of the research work of Zhytomyr Ivan Franko State University for 2014-2024 on the theme of "Theoretical and methodological bases of improving the educational process of physical education at higher educational institutions" (state registration number 0114U003978).*

## CONFLICT OF INTEREST

The Authors declare no conflict of interest

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 – Work concept and design,  – Data collection and analysis,  – Responsibility for statistical analysis,  – Writing the article,  – Critical review,  – Final approval of the article

**RECEIVED:** 11.03.2025

**ACCEPTED:** 23.07.2025

