

Musculoskeletal Health from Regular Statistical Sources in Slovenia for the Period from 2017 to 2021

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ABSTRACT

Musculoskeletal and connective tissue diseases which include around 150 different diseases represent a growing public health problem. This large group of diseases is often associated with the onset of mental illness, other chronic diseases and increased mortality. During the COVID-19 pandemic patients with musculoskeletal diseases were facing several challenges, such as medicine shortages, poor access to regular health services, particularly in developing countries. The present paper provides an overview of the situation in the field of musculoskeletal health of the population in Slovenia, based on data from regular health statistics, for a 5-year period, from 2017 to 2021. The retrospective-observational research was performed on the basis of data collected at the Slovenian National Institute of Public Health (NIJZ) and the Institute for Health Insurance (ZZZS). The COVID-19 pandemic, which marked the studied 5-year period, undoubtedly had an impact on musculoskeletal health in Slovenia. The results of our study showed a decrease in the rate of curative visits due to musculoskeletal diseases, both at the primary and secondary level of health care, a decrease in the number of issued prescriptions for medicines for the treatment of musculoskeletal diseases, a decrease in the rate of hospital treatment and longer sick leave.

Key words: musculoskeletal diseases, COVID-19, health statistics, health care, Slovenia

Introduction

Musculoskeletal health means the flawless functioning of the locomotor system, which includes muscles, bones, joints and adjacent connective tissues. Musculoskeletal diseases include more than 150 diseases that affect the locomotor system, as joint diseases (e.g. osteoarthritis, rheumatoid arthritis, psoriatic arthritis, gout, spondyloarthritis), bone diseases (e.g. osteoporosis, osteopenia and related fragility fractures), traumatic fractures, muscle diseases such as sarcopenia, multiple body areas or systems, such as regional (e.g. back and neck pain) and widespread (e.g. fibromyalgia) pain conditions, inflammatory diseases such as connective tissue diseases and vasculitis that have musculoskeletal manifestations, for example systemic lupus erythematosus, or amputation as a result of disease or trauma¹. These conditions are characterized by pain and reduced physical function, often leading to significant mental health decline, increased risk of developing other chronic health conditions and increased all-cause mortality^{1,2}. Musculoskeletal diseases often coexist with

other non-communicable diseases and increase the risk of developing other non-communicable diseases, such as cardiovascular diseases^{2,3}. Many musculoskeletal disorders are characterized by risk factors that are also characteristic of other chronic conditions. Such risk factors include, e.g. obesity, poor nutrition and a sedentary lifestyle, in addition to genetic and biological (age, gender) factors⁴.

A recent analysis of data from the Global Burden of Disease 2019 study found that approximately 1.71 billion people worldwide live with musculoskeletal disorders, including low back pain, neck pain, fractures, other injuries, osteoarthritis, amputations, and rheumatoid arthritis⁵. The prevalence of musculoskeletal disorders varies by age and diagnosis, and people of all ages are affected worldwide. High-income countries are the most affected by number of people (441 million), followed by the Western Pacific with 427 million and the Southeast Asian region with 369 million people. Musculoskeletal diseases are also the largest contributor to years lived with disability (YLD) worldwide, with approximately 149 million YLDs, accounting for 17% of all YLDs worldwide. Namely, they are among

those diseases that contribute the most to the need for rehabilitation services among children⁵. Additionally, two thirds of all adults with such diseases need rehabilitation⁵. Musculoskeletal disorders are also the cause of the largest share of persistent pain by geographic area and age⁴.

People with rheumatic and musculoskeletal diseases were facing several challenges during the COVID-19 pandemic, such as poor access to regular health services and medicine shortages, particularly in developing countries. COVID-19 represents a syndemic, synergistic condition that interacts with and exacerbates pre-existing diseases, other co-morbidities and social conditions⁶.

According to the World Health Organization (WHO), musculoskeletal disorders are the largest contributors to the disability worldwide, with low back pain being the leading cause of disability in as many as 160 countries. These types of illnesses significantly limit mobility and dexterity, leading to absence from work, early retirement, lower levels of well-being and reduced ability to participate in society. Due to the aging of the population, the number of people living with musculoskeletal diseases and related functional limitations is increasing rapidly⁷. The occurrence of the COVID-19 pandemic also had a negative impact on the musculoskeletal health of the population⁷. This new coronavirus infectious disease appeared in 2019. The causative agent, the SARS-CoV-2, spread very quickly among the population that was not immune and the disease caused a global public health emergency. The closure of public life, which was one of the measures to prevent the spread of SARS-CoV-2 infection, has been proven to have a negative impact on the musculoskeletal health of the population, as healthy people as well as patients became physically inactive. This led to the development of several types of diseases. Compared to the pre-pandemic period, a significant increase in pain was observed among the general population during the pandemic period. Musculoskeletal pain, which is usually short-term, can develop into a long-term problem in the absence of appropriate action⁸. Furthermore, the infection with the SARS-CoV-2 itself can cause a range of musculoskeletal symptoms, such as arthralgias, myalgias, neuropathies and myopathies. Even the therapeutics used in the treatment of patients with COVID-19 have proven musculoskeletal effects as well, as can be seen from the scientific literature⁹.

The aim of the present work is to provide an overview of the state of musculoskeletal health of the inhabitants of Slovenia from the point of view of outpatient visits and hospital admissions, medication consumption and sick leave due to musculoskeletal and connective tissue diseases in the period from 2017 to 2021, that includes the emergence of COVID-19.

Methods

The retrospective-observational research was conducted at the National Institute of Public Health (NIPH) of the Republic of Slovenia. The studied data refer to the observed 5-year period, from 2017 to 2021 inclusive.

The research was carried out on the basis of data from regular national health statistics, which are collected at NIPH, in accordance with the Act on Data Collections in the Field of Health Care¹⁰. Key data were processed with descriptive statistics (numbers, percentages) and displayed in tables, graphs and bar charts. The consent of the Commission of the Republic of Slovenia for Medical Ethics was not required to conduct the research.

Data on curative visits were obtained from the Records of basic health care and records of diseases and conditions identified in specialist outpatient services. The presented data include diagnoses of musculoskeletal and connective tissue diseases (Chapter M), which were written at the first visit at the primary level and final diagnoses at the secondary level¹¹. To calculate the rate of outpatient and inpatient treatments per 1,000 inhabitants, we took into account the number of all inhabitants in Slovenia in the reference group.

Data on hospital treatment due to diagnoses from Chapter M were obtained from the Record of Diseases, Injuries and Poisonings that require hospital treatment and were selected on the basis of the main diagnosis, i.e. the main condition or a disease that was diagnosed at the end of the hospital treatment as the main reason for which the person needed treatment in the hospital. The data display includes first and repeated cases of hospital treatment according to the main diagnosis¹².

Pharmacies in Slovenia report the data on prescribed medicines to the Institute for Health Insurance of Slovenia – ZZZS¹³, which collects, processes and forwards it to NIPH. The review of medicine consumption in the present analysis is based on the anatomical-therapeutic-chemical (ATC) classification of the WHO. Medicine consumption is presented by the absolute number of prescriptions issued and by the defined daily dose (DDD) per 1000 persons per day. DDD is a descriptive variable and means the average daily maintenance dose of a medicine that an adult receives for the treatment of the condition or disease that is the main indication of the specific medicine. One DDD is assigned to each ATC code and route of administration. Therapeutic doses are often different for individual patients and patient groups, but for research purposes there is a need to standardize the reporting of medicine use data by country, by population group and by year¹⁴.

Medicines for the treatment of musculoskeletal diseases were analyzed. They are classified into five subgroups of the so called ATC group M, which includes medicines for the treatment of musculoskeletal diseases: M01 - Medicines with anti-inflammatory and antirheumatic effect; M03 - Muscle relaxants; M04 - Medicines for the treatment of gout; M05 - Medicines for bone diseases and M09 - Other medicines for the treatment of disorders of the musculoskeletal system¹⁴.

The source of data of diagnoses from Chapter M regarding sick leave was the National database on abstinence from work¹⁵. Sickness absence is shown as an index of incapacitation (IO), which represents the number of lost calendar

days per one employed worker, and severity (R), which represents the average duration of one absence from work¹⁶.

Results

Between 2017 and 2021, primary care physicians reported a total of 1,983,395 first-time visits in which diagnoses of musculoskeletal and connective tissue diseases were recorded. While from 2017 to 2019 there were no major fluctuations or changes in the total number of first visits due to the mentioned diseases and conditions, there was a noticeable drop in the number of treatments in 2020, when the COVID-19 pandemic began, and in 2021 as well. Among all first visits, 42.3% were recorded in men and 57.7% in women. In the period from 2017 to 2019, the rate of first visits due to diagnoses of diseases of the musculoskeletal system and connective tissue at the primary medical level of health care did not change much, but in 2020 there was a noticeable decline, as shown in Table 1.

Table 2 shows the number and rate of final musculoskeletal and connective tissue diseases between 2017 and 2021 at the secondary level. The gender ratio was the same as for the first visits at the primary level, namely the proportion of women was 61.5% and the proportion of men was 38.5%. As can be seen, a drop in the number and rate of final diagnoses occurred in 2020, but in 2021, the number and rate of final diagnoses due to diseases of the musculoskeletal system rose again.

From 2017 to 2021, a total of 101,779 hospital admissions were recorded due to musculoskeletal and connective tissue diseases. From 2017 to 2019, there were no major fluctuations or changes in the total number of hospital treatments per year, but in 2020 and 2021 there is a noticeable drop in the number of treatments. The number of hospital treatments in 2020 was 23.2% lower than in 2019, and in 2021 it was 26.7% lower compared to 2019, as shown in Table 3.

The number of prescriptions issued for medicines mainly used to treat musculoskeletal and connective tissue diseases decreased in the period between 2017 and 2021, which is shown in Figure 1. In the years 2020 and 2021, a decrease in the prescription of medicines was detected compared to 2019. The fewest prescriptions were issued in 2020, approximately 1.12 million prescriptions with a value of EUR 18.7 million, and in 2021 1.15 million prescriptions with a value of almost EUR 19.5 million.

The consumption of medicines (presented by the number of DDDs per 1000 persons per day) increased between 2017 and 2021, which is shown in Figure 2 (ZZZS, 2022).

In 2020, 84,446 cases of sick leave due to musculoskeletal and connective tissue diseases were recorded among working people in Slovenia, but in 2021, 88,738 were recorded. In 2021, the IO, which as mentioned represents the number of lost calendar days per employed worker due to diagnoses of musculoskeletal and connective tissue diseases, was 4.08 days per employed worker, as shown in

TABLE 1
NUMBER AND RATE OF FIRST VISITS DUE TO THE DIAGNOSES OF MUSCULOSKELETAL AND CONNECTIVE TISSUE DISEASES BY GENDER, BETWEEN 2017 AND 2021

YEARS			WOMEN		SUM	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
	170.149	165.8	232.359	223.4	402.508	194.8
	179.984	174.7	245.196	235.8	425.180	205.4
	183.801	175.8	250.936	240.5	434.737	208.1
	142.145	134.8	191.586	183.2	333.731	158.9
	163.339	154.4	223.900	213.5	387.239	

Source: Databases NIPH.

TABLE 2
NUMBER AND RATE OF FINAL DIAGNOSES OF THE MUSCULOSKELETAL AND CONNECTIVE TISSUE DISEASES AT THE SECONDARY LEVEL BY GENDER, BETWEEN 2017 AND 2021

YEARS	MEN		WOMEN		SUM	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
2017	77.436	75,5	120.244	115,6	197.680	95,7
2018	74.565	72,4	114.810	110,4	189.375	91,5
2019	79.141	75,7	120.732	115,7	199.873	95,7
2020	68.282	64,8	102.816	98,3	171.098	81,5
2021	81.586	77,1	122.375	116,7	203.940	96,8

Source: Databases NIPH.

TABLE 3
NUMBER AND RATE OF HOSPITAL ADMISSIONS DUE TO DIAGNOSES OF MUSCULOSKELETAL AND CONNECTIVE TISSUE DISEASES BY GENDER, BETWEEN 2017 AND 2021

	MEN		WOMEN		SUM	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
2017	9.790	9.5	12.866	12.4	22656	11.0
2018	9.370	9.1	12.798	12.3	22168	10.7
2019	9.758	9.3	13.017	12.5	22775	10.9
2020	7.554	7.2	9.936	9.5	17490	8.3
2021	7.408	7.0	9.282	8.8	16690	7.9

Source: Databases NIPH.

Table 3. The number of lost calendar days per employee increased from 2017 to 2021, but a decrease was detected in 2020. The average duration of one case of sick leave (R) due to musculoskeletal and connective tissue diseases was the longest in 2021, namely 42.81 days. Over the 5-year period, the average duration of one case of absence from work increased.

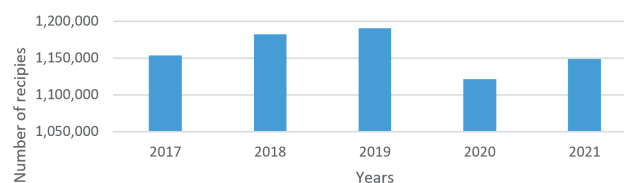


Fig. 1. Number of prescriptions issued for medicines from ATC group M, between 2017 and 2021. Source: Databases ZZS.

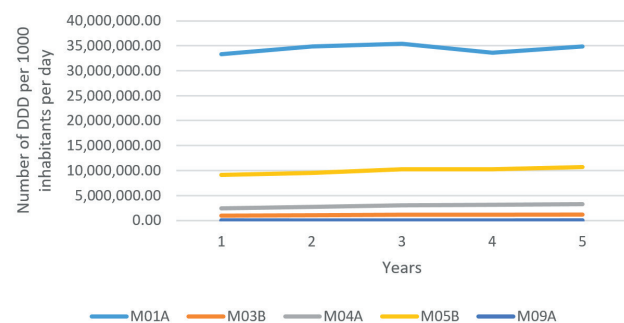


Fig. 2. Number of DDDs per 1000 persons per day for medicines for the treatment of musculoskeletal diseases, between 2017 and 2021. Source: Databases ZZS.

Discussion

A retrospective-observational research on musculoskeletal health in Slovenia in the period from 2017 to 2021, carried out at the NIPH, showed that the number of first curative visits due to musculoskeletal and connective tissue diseases at the primary level decreased in 2020, as did the number and rate of final diagnoses due to these diseases. The international research called INTRePID

TABLE 4
NUMBER OF CASES, DISABILITY INDEX (IO) AND AVERAGE DURATION OF ONE CASE OF SICK LEAVE (R) DUE TO MUSCULOSKELETAL AND CONNECTIVE TISSUE DISEASES BETWEEN 2017 AND 2021

	CASES	IO	R
2017	86.617	3,31	33,17
2018	95.548	3,69	34,70
2019	100.712	4,03	36,66
2020	84.446	3,94	42,17
2021	88.738	4,08	42,81

Source: Databases NIPH.

Legend: IO-disability index; R-average duration of one case of sick leave

(English: International comparative study by the International Consortium of Primary Care Big Data) showed that during the pandemic, the decline in the number of personal visits to a doctor at the primary level was a global phenomenon. On the other hand, the number of virtual visits to the doctor has increased significantly in countries where such visits were already introduced before the onset of the pandemic, e.g. in Norway, the United Kingdom, Sweden¹⁷. The number of out-of-hospital treatments at the secondary level also decreased in 2020 and 2021, which is also confirmed by foreign research. One of the major similar international studies also showed that the number of users of health services decreased at the secondary level¹⁸.

The number of hospitalizations due to musculoskeletal and connective tissue diseases decreased in Slovenia during the observed period. Some authors report a 50% reduction in hospital admissions and greatly increased treatment costs due to adherence to hygiene instructions during the pandemic¹⁹.

The number of prescriptions issued for medicines, which are mainly used to treat musculoskeletal and connective tissue diseases, also decreased during the studied period. The fall is particularly noticeable in 2020. When reviewing the scientific literature, we found that some foreign authors also describe the negative impact of the COVID-19 pandemic on the availability of appropriate

medicines. In about half of the patients with rheumatoid arthritis included in the research, they found reduced access to urgently needed medicines²⁰.

The number of lost calendar days due to musculoskeletal and connective tissue diseases per employee increased from 2017 to 2021. In 2020, the year of the COVID-19 pandemic, a decrease in the number of lost calendar days has been observed. Data on sick leave show that in 2021 the greatest number of lost calendar days per employed worker were due to musculoskeletal and connective tissue diseases, followed by injuries, poisoning and some infectious and parasitic diseases¹⁶. In 2021, the average duration of one case of sick leave due to musculoskeletal and connective tissue diseases was the longest, over 40 days. The average duration of one case of absence from work increased over the 5-year period.

According to the records of the influence of biological and non-biological factors on the poor treatment outcomes of some musculoskeletal diseases, e.g. of rheumatoid arthritis in the pandemic period, regardless of SARS-CoV-2 infection, some authors suggest a holistic view of the disease in future studies. The syndemic view, which was created by the introduction of anthropology into research in the field of health, seems particularly appropriate to them. The emerging evidence on both biological and non-biological factors implicated in worse outcomes in people with rheumatic and musculoskeletal diseases affected by the COVID-19 pandemic, whether infected by the virus or not, calls for the need to use more novel and holistic frameworks for studying the disease. In this context, the use of a syndemic framework becomes particularly relevant⁶.

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Research Limitation

In the present research, only medicines from ATC group M were analyzed. Medicines with an effect on the nervous system (ATC group N), e.g. pharmacological group N02 - analgesics, which are also used to treat musculoskeletal and connective tissue diseases, as well as many other diseases and conditions, were not analyzed.

Conclusion

The main findings of the present retrospective-observational research based on data from the Slovenian national databases for the period from 2017 to 2021, which was marked by the COVID-19 pandemic, are a reduction in the rate of curative visits due to musculoskeletal diseases both on primary and secondary level of health care, a reduced number of prescriptions issued for medicines for the treatment of musculoskeletal and connective tissue diseases, a reduction in the rate of hospitalization and longer sick leave due to these diseases. The COVID-19 pandemic undoubtedly had a negative impact on the musculoskeletal health of the inhabitants of Slovenia. Musculoskeletal and connective tissue diseases represent a major public health problem in the light of aging of the population. They have been exacerbated by the COVID-19 pandemic and should therefore require full attention in the future. In order to avoid a recurrence of the deterioration of the condition of patients with musculoskeletal and connective tissue diseases in the face of potential new epidemics, it is necessary to find appropriate solutions both in terms of access to a physician, as well as in terms of access to appropriate medicines.

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ZDRAVLJE MIŠIĆNO-KOŠTANOG SUSTAVA IZ REDOVITIH STATISTIČKIH IZVORA U SLOVENIJI ZA RAZDOBLJE OD 2017. DO 2021.

SAŽETAK

Bolesti mišićno-koštanog sustava i vezivnog tkiva koje obuhvaćaju oko 150 različitih bolesti predstavljaju sve veći javnozdravstveni problem. Ova velika skupina bolesti često je povezana s nastankom duševnih bolesti, medicinskih kroničnih bolesti i povećanom smrtnošću. Tijekom pandemije COVID-19 pacijenti s bolestima mišićno-koštanog sustava suočavali su se s nekoliko izazova, kao što su nestašica lijekova, loš pristup redovnim zdravstvenim uslugama, posebno u zemljama u razvoju. U radu je dan pregled stanja na području zdravlja mišićno-koštanog sustava stanovništva u Sloveniji, na temelju podataka redovite zdravstvene statistike, za 5-godišnje razdoblje, od 2017. do 2021. Retrospektivno-pro-matračko istraživanje provedeno je na temelju podataka prikupljenih na slovenskom Državnom institutu za javno zdravstvo (NIJZ) i Zavodu za zdravstveno osiguranje (ZZZS). Pandemija COVID-19, koja je obilježila proučavano petogodišnje razdoblje, nedvojbeno je utjecala na zdravlje mišićno-koštanog sustava u Sloveniji. Rezultati našeg istraživanja pokazuju smanjenje stope liječenja zbog bolesti mišićno-koštanog sustava, kako na primarnoj tako i na sekundarnoj razini zdravstvene zaštite, smanjenje broja izdanih recepata za lijekove za liječenje bolesti mišićno-koštanog sustava, smanjenje stopa bolničkog liječenja i duža bolovanja.