Occupational Health and Safety of Food Industry Employees with Emphasis on Specific Diseases

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Abstract

Musculoskeletal disorders are currently a highly debated topic and the subject of an OSHA EU campaign, as their severity is increasingly leading to incapacity for work and hospital admissions. Already in younger age groups, they pose significant problems for employees and employers alike. The article focuses on occupational safety and health with regard to the opinion of employees. Using the questionnaire method, the opinions of employees on the issue in the selected were found out. The results of the survey were compared and statistically evaluated so that the differences in the feelings of men and women could be found out. The survey was conducted in January 2021 in the Czech Republic in workplaces of the food and 294 employees participated. Aim of the article is to show the possibilities of monitoring and monitoring ergonomic risk factors, including the development of a final survey in some company workplaces of the food industry. Then point to out the sources of possible risks associated with the occurrence of a group of diseases related to nerves, tendons and supporting structures and to propose the application of proactive and reactive ergonomics measures to eliminate them.

Keywords: Occupational health and safety, musculoskeletal disorders, ergonomic risk assessment, human resources, enterprise management

Introduction

The average person spends a large part of their life in the workplace. A characteristic feature of our times is the increasing demands of work. In particular, demands on labour productivity, performance, efficiency, quality and qualifications. In order to be able to perform well at work throughout his or her life, occupational health should be a top priority. Every job has its set procedures which require the employee to be physically fit. A person is forced to perform work in a certain imposed position, which is determined by the work activity and the parameters of the workplace. He has to work in this position for a long period of time, which has an impact on his health. Indoor positions usually have a negative effect, particularly on the physical side, and can lead to pain or illness. They most often cause diseases of the musculoskeletal system. For the company, this means an increase in costs for the employee, such as compensation costs in the event of a proven occupational disease and an increase in sick leave. It can also lead to a reduction in work performance. The inclusion of occupational health and safety will ensure the avoidance of costs associated with work-related injuries and

improve employee productivity. Every company should take care to improve working conditions within its own costs. It should ensure that employees work in the most appropriate working conditions and thereby protect the health of employees. Modifying the layout of work equipment in the workplace or the use of appropriate work equipment is sufficient to eliminate undesirable effects of the working environment. The solution to these negative effects is the scientific discipline that deals with the man-machine-work environment relationship, this science is called ergonomics. It seeks to clarify the relationships between these components for the purpose of occupational safety and health. Ergonomics in enterprises is nowadays applied at various levels. It depends on the approach of management, the type of production or cooperation with health professionals. The incidence of occupational diseases is one of the indicators of employee health care and reflects the state of primary prevention of occupational diseases (Health, 2017).

Prevalence of health problems with regard to occupational diseases

Disorders of the musculoskeletal system are a major cause of absenteeism from work. Musculoskeletal disorders result in increasing costs to the public health system. They can affect different areas of the body and work tasks (WHO, 2018). Unilateral prolonged and excessive loading of the musculoskeletal system above or below the limits of their biological resistance, such as excessive pulling, pressure on certain tissues, or a high number of repetitive movements that a worker performs in their job, where full recovery does not occur after the load, leads to damage to tendons, joints or nerves. Carpal tunnel syndrome (CTS) is one of the most common neuropathies of the upper limbs. It is caused by compression of the median nerve that passes through the carpal tunnel (Wipperman, 2016). It most commonly occurs in people around the ages of 40 to 70 (PubMed Health, 2017). According to several studies, females predominate (4:1 ratio) among patients with CTS with bilateral limb involvement. Usually, the dominant limb is affected earlier and to a greater extent in terms of time (Kurca, 2004). Difficulties of the supportive-musculoskeletal system are usually manifested by long-term pain and limitations in mobility, dexterity, and functional abilities as well as reduced work capacity. These ailments can arise in any employee, they can be prevented by assessing work tasks, implementing preventive measures as well as follow-up. The occurrence of difficulties and diseases of the support and locomotor system is related to the deficiencies of the workplace in terms of ergonomics and insufficient adaptation of work and working conditions for employees (Hatiarová, 2007).

In the case of diseases from prolonged excessive unilateral strain, it should be emphasized that the occurrence of the disease is conditioned by the factors of work, the physical equipment of the worker for a certain type of work and the method of its performance. Non-occupational factors such as age, smoking, obesity or sporting activity also have an adverse effect on the onset. Another group includes various injuries and past illnesses (Hatiarová, 2007). Disorders from excessive unilateral strain are one of the most common health problems in the working population. They affect the quality of life, which influences the increase in the number of sickness or early retirement. They can also cause a large economic burden due to the cost to society and the loss of employee's wages (Cheng, 2016). Diseases of the musculoskeletal system are largely involved in reducing an individual's quality of life. The difficulties gradually progress from acute to chronic forms and can lead to disability. Difficulties and pain limit the worker in performing work tasks and gradually deteriorate the physical condition of the individual. This results not only in personal hardship to the worker and loss of income, but also costs to the business (Hatiarova, 2007). In diseases from long-term excessive and unilateral strain, the Slovak Republic has had the highest incidence of diseases of the upper limbs' support and locomotor system since the end of the 20th century in the long term. For diseases applying the individual side of the individual and other factors of the working environment, almost half of the work groups are registered in the 1st and 2nd categories of work. With an eye on the rapidly changing industry and new technologies, occupational diseases will change in the future and new occupational health impairments will arise (Buchancova, 2016).

Specific attention must be paid to all musculoskeletal disorders that belong to the groups of diseases relating to nerves, muscles tendons and supporting structures According to the European Agency for Safety and Health at Work, such diseases are among the most common work-related diseases. This disease affects millions of employees in Europe, impairing their quality of life. These problems also cost employees billions of euros. The number of such illnesses is collapsing over time, and it is therefore necessary to address this issue comprehensively and to focus on the various combinations of factors that cause it. The main factors include:

- Physical and biomechanical risk factors may include:
    - Handling loads, especially when bending and twisting
    - Repetitive or forceful movements
    - Awkward and static postures
    - Vibration, poor lighting or cold working environments
    - Fast-paced work
    - Prolonged sitting or standing in the same position

- Organisational and psychosocial risk factors may include:
    - High work demands and low autonomy
    - Lack of breaks or opportunities to change working postures
    - Working at high speed, including as a consequence of introducing new technologies
    - Working long hours or on shifts
    - Bullying, harassment and discrimination in the workplace
    - Low job satisfaction (European, 2021).

The combination of these factors impairs the quality of life of employees and can result in a variety of risks (Soltes, 2016). To create a safe environment, employers need to know the determinants that go into it. In the case of a risk manager, it is necessary to monitor any deviations that would cause losses to the business. It is the incapacity of employees that brings financial costs and can jeopardize the production process (Buganova, 2019). Another problem from a safety perspective could be that the employee in question causes an accident, in case he or she fails to properly address the current risks (Lovecek, 2016; Ristvej 2017). Here, space is created for education and training of employees also with regard to health complications. In case physical and psychological responsiveness would also be assessed, this would allow to manage potential crisis situations more effectively (Sventekova 2016; Mitasova, 2017). Such preparation will allow them to carry out the necessary procedures in case of a threat also with regard to musculoskeletal disorders. The combination of mental and physical preparedness creates room for a safe environment with regard to unexpected events (Polorecka 2020).

Materials and Methods

Whether company managements are aware of it or not, this is a fundamental problem that can be addressed either when serious problems arise or as a preventive measure when obvious problems do not yet exist. In any case, the latter option is the most effective and, if well applied, can ensure that the worker remains in the job for many years in relatively good health. Musculoskeletal disorders - a group of disorders involving nerves, tendons and supporting structures (MSDs) as a result of work activity represent cumulative disorders as a result of repeated high intensity loads over a prolonged period of time, as well as acute injuries such as fractures and others. The body segments affected are mainly the back, neck, shoulders and upper limbs, wrists (carpal tunnel) and others (OSHA EU). In order to ensure an optimal solution to MSD problems (at the company level, it is essential to proceed in a systematic, planned and step-by-step manner. As in all occupational safety procedures, there are four phases:

- Preparation and plan of action
- Assessment of relevant risks
- Implementation and control of identified preventive and mitigating measures
- Periodic review and update of risk assessment.

As a result of the inspection carried out in the company, the situation was to be determined by means of the employees' subjective perception of ergonomic aspects and other factors. This was to give a certain picture of the MSD situation in the company. On the basis of the results, basic measures for improving the observed situation were to be proposed. The original ambition of the research team was much broader and the subjective assessment of the employees was to be supplemented by the results of the temporal application of small ergonomic aids according to the nature of the workplace and workstations and the determination of their influence on the improvement in the field of MSDs. The timing of the study was influenced by the ongoing COVID-19 pandemic, where access to workplaces and businesses in general was severely restricted. Therefore, the original design of the survey was re-evaluated. Thus, in the end, only the application of subjective feelings questionnaires at different workplaces in the enterprise was conducted.

In January 2021, a survey of the company's employees was conducted using structured subjective feelings questionnaires. These were employees working on a permanent basis. The company in which the survey took place is located in the Czech Republic. The questionnaire was distributed to the respondents after a brief training session and a supplementary introduction to ensure that the employees understood the basic concepts of preventive medicine surrounding the topic. A

total of 294 employees completed the questionnaire out of a total of 426 tribal employees working in the company. The remaining 132 employees were unable to complete the questionnaire because they were on sick leave, parental leave, or had another purpose for their absence at the time. At the beginning of the survey it was necessary to identify the respondents on the basis of some characteristics. When we divided the respondents by gender, we found that there were 58.5% women and 42.5% men. This composition will allow us to generalize the results for both groups. Focusing on age, the following was the distribution of respondents in intervals according to age:

- <19, 30) - 8, 8 %
- <30, 40) – 17,3 %
- <40, 50) – 32,7 %
- <50, 60) – 27,9 %
- <60, plus) – 8,5 %
- N/A – 4,8 %

The questionnaire was divided into several parts. At the beginning, there was a passage devoted to the objectives of the survey and the issue of musculoskeletal disorders. With the help of the survey, an analysis of the subjective opinions of the employees of the selected enterprise was carried out. Also the individual results of the survey were compared and treidené into groups according to the characteristics.

Results

Identifying the work of employees in the selected enterprise

An occupational health and safety survey was conducted in a selected food processing plant, In particular, their musculoskeletal disorders were investigated. In identifying the respondents, we ascertained how long they had been working in the enterprise. The years of service ranged from a few months to 40 years. The figure 1 shows the length of years of service by gender. There was an option not to indicate the length of service so that the respondent would not be under the impression that he/she would be identified. The largest proportion of respondents had worked in the business between 1 and 5 years, followed by between 6 and 10 years. The fewest respondents had worked in the business for 31-40 years.

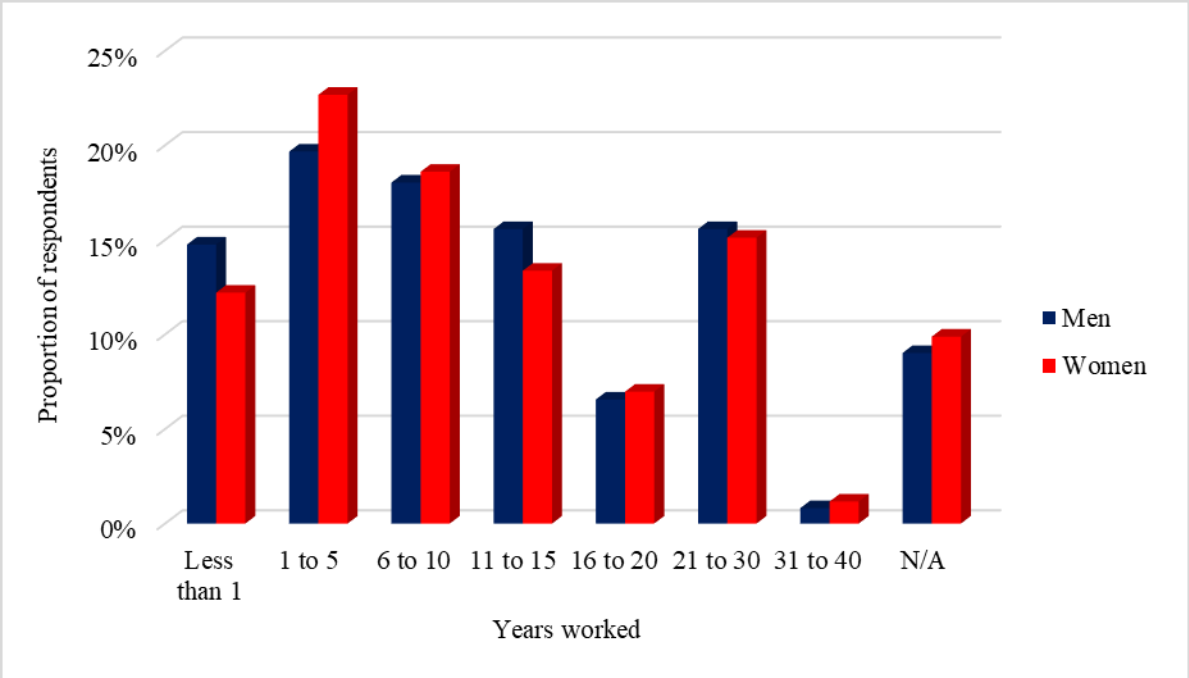

Fig 1 Length of service by gender and proportion of respondents in each age group

We then looked at whether employees were also working overtime. The figure 2 shows than the largest number of respondents for both genders indicated the occasional option. These results were balanced as 62% of respondents of each

gender marked this option equally. For the options often and never, the results were already slightly different. Overtime work was often done by 16% of men but only 10% of women. According to the results, overtime work was never performed by 13% of men and up to 23% of women. Also, some respondents indicated that they did not want to answer.

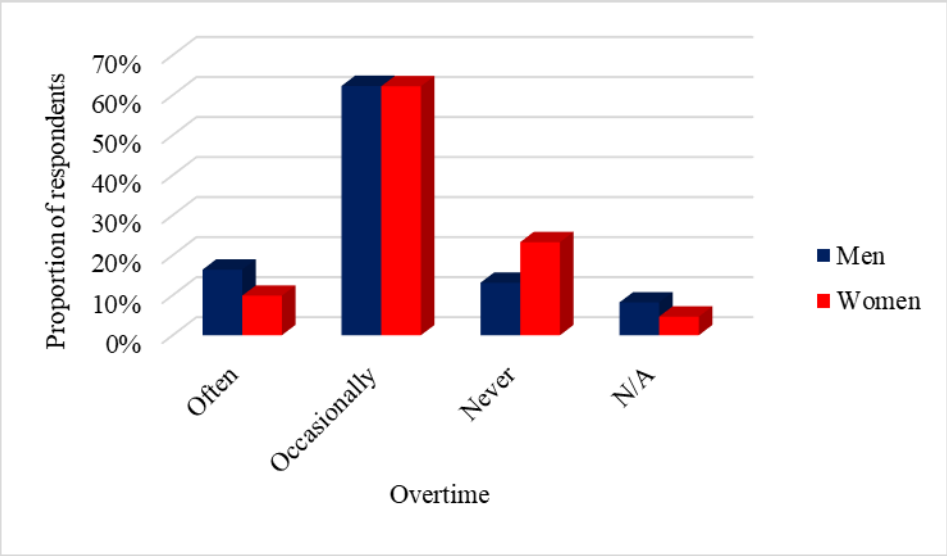

Fig 2. Overtime for employees by gender

An important focus was also on exploring the feelings of employees with regard to the demands of the work. On this question, the results were already more pronounced in the feelings of men and women. Most respondents from both genders indicated the option of doing moderately difficult work. This option was indicated by 61% of men and 58% of women. The difficulty of the work was marked as difficult by 18% of men and 32% of women. Light work was the option indicated by 20% of men and 8% of women. Here we can see significant differences in the feelings and perceptions of its difficulty. The results are shown in Figure 3.

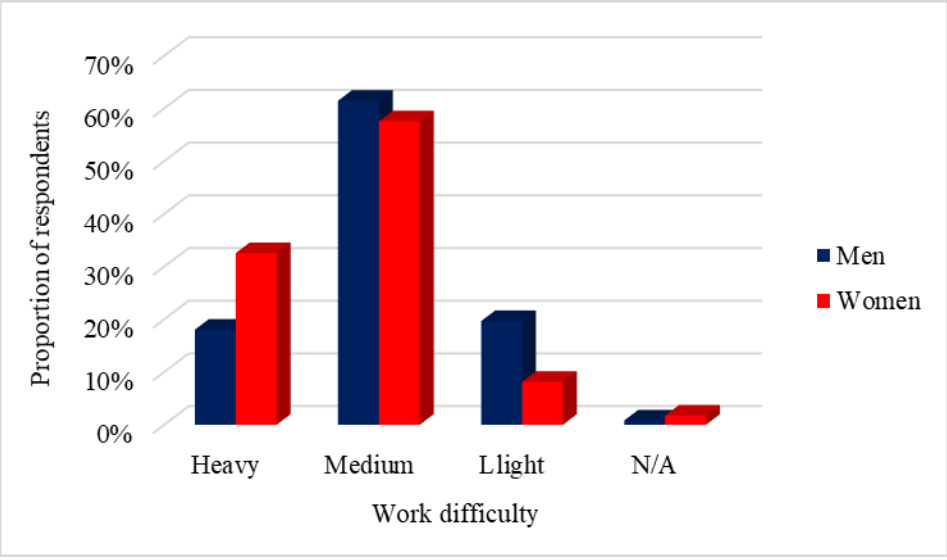

Fig 3. Employees' feelings of job demand by gender

Subsequently, attention was paid to the types of work with ergonomic risk factors. The results of these types are shown in Figure 4 and displayed by gender. Within each type, the respondent could indicate the possibility that he/she performed the activity. When broken down by gender, females predominated in each activity type, the only exception being kneeling work where more males than females indicated this option. Standing/sitting for long periods of time was the most common option indicated by 78% of women. For men, 60% of men indicated this activity. The next most common response was

manual handling of heavy loads for 72% of women and 54% of men. Joint movements during work were seen as frequent by 68% of women and 60% of men.

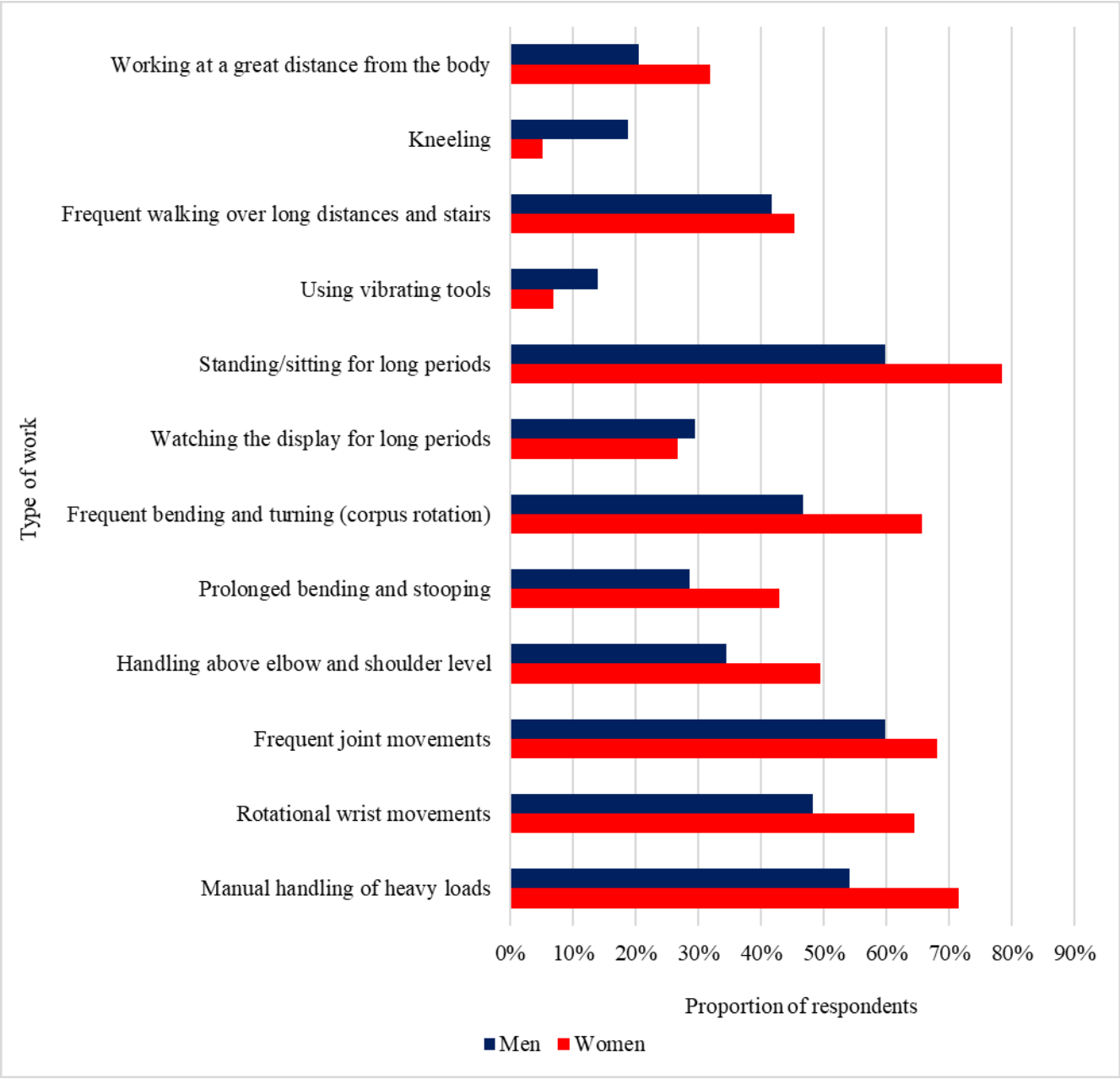

Fig 4. Types of work with ergonomic risk factors by gender.

Health problems of employees in a selected enterprise with regard to musculoskeletal disorders

In order to be able to take action later to improve OSH, employees were given the opportunity to comment on the pain they felt. These feelings were on a six-point scale. Figure 5 shows the results of the perceived pains by gender. To avoid respondents being forced to select a particular sensation which could skew the results, they were also allowed to comment on the pain. The difference in men's and women's perception of pain can be considered as an important finding. Across pain types, on average, women felt more pain than men. When focusing on the sensation of severe pain, there was always a greater proportion of women than men when comparing the different types of pain by gender.

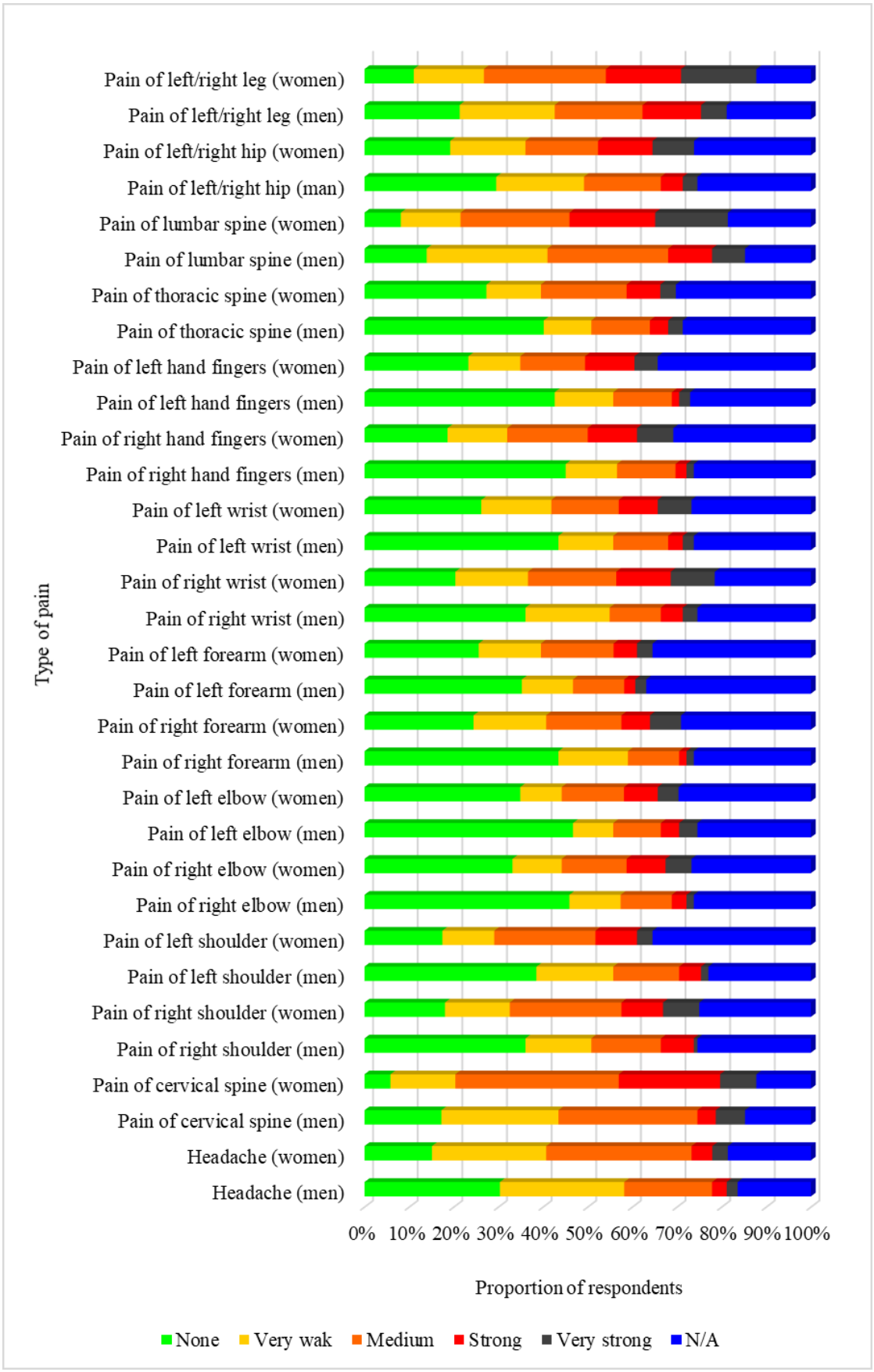

Fig 5. Employees' feelings of pain

Discussion and Conclusion

Investigations at several workplaces have shown that MSDs are rightly at the forefront of occupational health and safety issues in the EU. They are the subject of continuous EU campaigns and these disorders are the most prevalent occupational health problem. They account for millions of lost working hours, worker disability, early retirement, and overall billion-dollar losses in the economy. Modern approaches require, above all, the awareness of relevant managers, employees, workers and their trade unions. The investigation has shown that even occupational health practitioners do not have the necessary and relevant information to address this issue. What can be considered a positive factor in our investigation is the interest and willingness of workers to perceive the issue, answer questions and express subjective feelings of ergonomic comfort and discomfort. This is also shown by the results of the individual questionnaire surveys on different aspects of workplace ergonomics. To improve the situation, it is not surprising to see proposals from renowned ergonomic workplaces translated into EU campaigns. This means raising awareness of the importance of preventing MSDs in the workplace, assessing risks and addressing them in a targeted manner, addressing MSD risks in all workplaces, even those with seemingly no risk, identifying new ergonomic risks of MSDs in modern workplaces and in new types of work activities, stimulating cooperation between the various parties and, finally, proposing preventive and follow-up solutions for occupationally-related MSDs that have already arisen.

The results of the survey showed the fact mentioned in the introduction of the communication that the issue of MSDs is perceived very intensively in companies and is serious even according to objective findings. Employees are interested in it and understand that long-term loading of the musculoskeletal system can and mostly does lead to MSD problems and diseases, often of a disabling nature. The survey also shows that women perceive the issue more intensely and experience various problems more frequently, whether it is overtime work, inappropriate working positions, physical strain and pain and discomfort felt at work. The seriousness of the issue is reflected in the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - A Strategic Framework for EU Health and Safety at Work 2021-2027 Safety and Health at Work in a Changing World of Work. Here they list MSD issues, including occupational stresses, among the three major problems to be addressed. In this context, the next EU-OSHA 'Healthy Workplaces Campaign' for 2023-2025 will also be launched to create a safe and healthy digital future, covering in particular psychosocial and ergonomic risks. Also, differences in perceptions of the perceived demands of work as well as in perceptions of pain at work between genders can be considered as significant findings of the survey. Women perceived their work to be more demanding which was also reflected in the pain caused by work. Therefore, it is necessary to pay more attention to women's OSH and to take new measures to improve their working conditions as well as their subjective feelings. Based on the findings of the questionnaire survey, the management of the production company is considering investments in the form of hoists and other ergonomic aids such as ergonomic mice, wrist pads and seat cushions. Employees are invited by management to submit suggestions under the 'Safety Improvements' programme for concrete and workable employee safety solutions. Improvements for employees, reduced workload, reduced communication, and reduced sick leave can be expected. at them.3

It is important that management emphasizes safety in the company. Authors such as Stefanovic et al (2021) also point to this fact. Safety in a company consists of many components and Occupational health and safety is one of its most important, which is sometimes underestimated (Hasle, 2021). Other authors emphasize that a high level of health and safety in the company will also improve the comfort of employees, which will also enable better results at work (De Cieri 2021). In order to improve Occupational health and safety in companies, it is necessary to adopt new innovative approaches (Threeton. 2021). It is important to examine the views of employees and look for shortcomings, as we pointed out in the article. The information just found should form the basis for improving working conditions in companies.

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