

THE IMPACT OF REMOTE WORK OF UNIVERSITY TEACHERS DURING THE COVID-19 PANDEMIC ON OCCUPATIONAL HEALTH AND SAFETY WITH A FOCUS ON PSYCHOLOGICAL AND MUSCULOSKELETAL WELL-BEING

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Abstract: The Covid-19 pandemic has changed working conditions in many industries. Some of them have been completely closed, with no possibility of any professional activity, others have changed the manner of performing employee tasks, place and time. Many jobs have been moved home. These were mainly service industries, where exposure to psychophysical hazards increased incomparably to the previous working conditions. Administrative and office work during the Covid-19 pandemic has brought huge changes in the form of an increased risk of musculoskeletal disorders. This article presents the results of quantitative and qualitative research on the scale of musculoskeletal ailments in the administrative and office work of academic teachers and preventive measures to reduce the effects of these ailments. The research was conducted remotely using a questionnaire in three research and teaching centers in the Silesian Voivodeship. Quantitative research was supported by a direct interview conducted directly among academic teachers at one of the universities in the Silesian Voivodeship. According to the presented research results, respondents noticed a significant increase in musculoskeletal disorders dictated by the rapid change in working conditions related to the Covid-19 pandemic. Every second respondent pointed to non-ergonomic working conditions at home and a long time of exposure to static physical load, with particular emphasis on the sitting position (at the computer), as the main cause of the ailments. The research also touched on issues related to preventive measures to minimize the aforementioned ailments undertaken by both universities and the respondents themselves. The presented results are part of a larger whole planned over time.

Keywords: academy teacher, musculoskeletal complaints, occupational health and safety, prevention.

1. INTRODUCTION

Academic teachers had to change their working conditions very abruptly during the Covid-19 pandemic. There was no time to prepare for such major changes in the conditions of the employee's tasks. Almost overnight, after the announcement of the state of epidemic in Poland on March 20, 2020, the Regulation of the Minister of National Education on the introduction of distance learning came into force. Changing the nature of work from active to long-term sitting at the computer may have influenced the onset or severity of musculoskeletal disorders. In addition, the aforementioned ailments were affected by stress resulting from the sense of fear and threat of virus infection, as well as social isolation (Sharma and Vaish, 2020). In addition, it should be taken into account that academic teachers (but not only) found themselves in such a difficult, new life situation for the first time caused by the "lockdown" (Baryshnikova et al., 2021; Klimecka-Tatar et al., 2021; Zyznawska and Bartecka, 2012). In the light of the available reports on the difficulties in implementing remote teaching during the pandemic, academic teachers complained primarily about the lack of optimal access to platforms enabling the implementation of remote education, difficulties in using information technology tools, equipment deficits, as well as insufficient development of their own practical competences in this area (Waligóra, 2021). It should also be noted that the unexpected outbreak of the pandemic interrupted classes that were carried out in a pre-planned manner, according to a specific schedule and required teaching tools. Often it was highly specialized laboratory equipment. Therefore, not only the conditions of education have changed, but also the teaching methodology of individual subjects. In many areas, the implementation of, for example, practical classes was almost or not possible at all (Czerniewicz, 2020; Zimmerman, 2020; Stanger, 2020).

Musculoskeletal ailments as well as mental ailments of academic teachers were influenced by both psychophysical hazards associated with high exposure of academic teachers to forced work sitting at the computer and psychosocial hazards associated with isolation and uncomfortable contact with students. Also resulting from a disturbed balance between private and professional life (work life balance). This is indicated by the results of many studies conducted in Poland (Zejda et al., 2009; Sochacka and Zdziarski, 2022; Niciejewska and Kasian, 2019; Niciejewska, 2020) as well as in other European Union countries (Cieza et al., 2021; Abdul Rahim et al., 2022). Of course, the health effects, both physiological and psychological, will probably be more visible in a few years. In November 2022, the European Agency for Safety and Health at Work will summarize the results of the campaign entitled "Healthy and safe workplace 2022" with priority areas, namely "Prevention of work-related musculoskeletal disorders" and "Psychosocial risks related to remote work". Preliminary studies now show a large increase in musculoskeletal conditions associated with remote work (according Report of European Agency for Safety and Health at Work). During the campaign, great emphasis was placed on preventive measures to minimize the effects of remote work during the pandemic, carried out by both companies and employees themselves. The problem of musculoskeletal ailments did not end with the end of the pandemic. The adopted forms of remote work in many industries have become dominant and forever changed the methods, tools and conditions of some professions and workstations.

2. RESEARCH AREA

The presented research results refer to the period between autumn 2021 and autumn 2022. The survey questionnaire was sent electronically to 7 universities in the Silesian Voivodeship. They were answered by 5 universities to which the research questionnaire was dedicated. In general, 320 academic teachers took part in the study, who during the pandemic carried out their didactic work remotely. After verification of the collected questionnaires, 300 correctly completed questionnaires were selected for analysis. In terms of age structure, the largest group of respondents were academic teachers aged 35-44 - 42.2%. More than half of the respondents worked as lecturers for more than 12 years. Over $\frac{3}{4}$ of the respondents indicated mental work in conditions of forced work sitting at the computer as the one that significantly deteriorated their physical and mental health. Only every fifth respondent confirmed that the university showed interest in preventive measures due to high exposure to psychophysical hazards related to static physical workload. At that time, the interested people themselves rarely showed attention to the musculoskeletal system. In order to verify the results of quantitative research, a face-to-face interview was conducted at one of the partner universities in the Silesian Voivodeship. The research and teaching institution was selected for additional (qualitative) research because:

- handed over correctly completed questionnaires,
- consented to talks with academic teachers via ClickMeeting.

3. RESULTS AND DISCUSSION

Creating appropriate ergonomic conditions at the workplace is one of the key elements ensuring comfort and convenience of work for the employee, without causing negative effects on the employee's physical and mental health. In the first part of the survey, respondents were asked about several issues related to the workplace itself, which they had to secure at home during remote work during the pandemic. The first area for analysis was the adaptation of the workplace - desk and seat - to the needs of the surveyed employee. The data obtained are presented in Figure 1, taking into account the number of people who gave negative and positive answers.

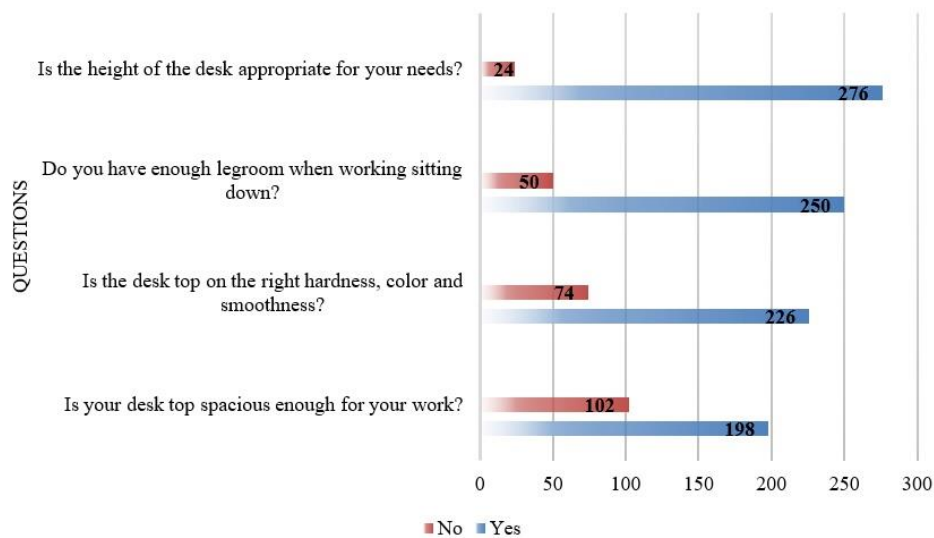


Fig. 1. Adjusting the workspace and desk top to ergonomic needs

Analyzing the presented results from the research, it should be stated that the desks in private possession of the respondents did not meet the requirements in one hundred percent. The biggest problem was too little desk space. Over 100 respondents indicated that their desk does not have enough space for the work they do at home. Almost every fourth respondent was also dissatisfied with the hardness, smoothness and color of their desk top. In turn, almost every sixth academic teacher did not have enough legroom when working at a desk.

Another area of analysis related to the ergonomics of the workplace affecting possible musculoskeletal ailments was the condition and dimensions of the seat. According to ergonomic guidelines, the seat is a very important element in administrative and office work. The sitting position is a forced position that determines the static physical load. In a large time exposure, it is a threat that can have a decisive impact on the human musculoskeletal system. Respondents answered a few questions that were asked in the questionnaire and related to the aforementioned seat. The results are shown in Figure 2.

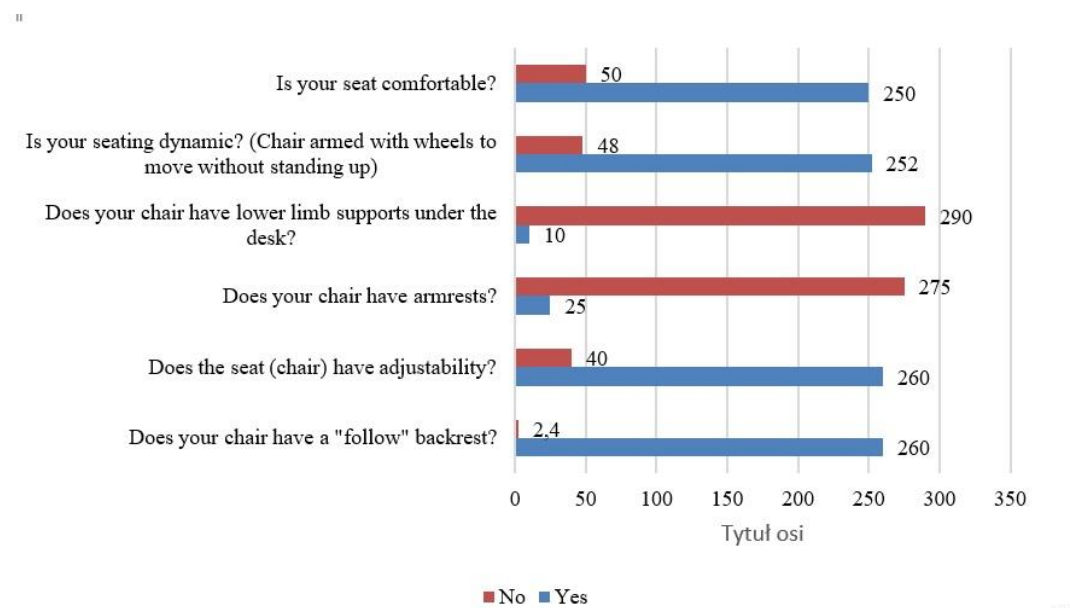


Fig. 2. Adaptation of the seat to ergonomic requirements

The obtained data shows that the majority of respondents have ergonomic chairs. Almost 87% of respondents have a chair with the so-called following backrest, which is a stabilizer for the user's back and relieves the back during long exposure to static (sitting) physical work. However, almost no academic teacher has a support for the lower limbs under the desk. Also 84% of the respondents do not have a chair that has wheels for moving without changing the position (dynamic seat). Another element of the study of the working conditions of academic teachers dictated by the pandemic (remote work at home) was the adaptation of the monitor screen to their needs. The results are shown in Figure 3.

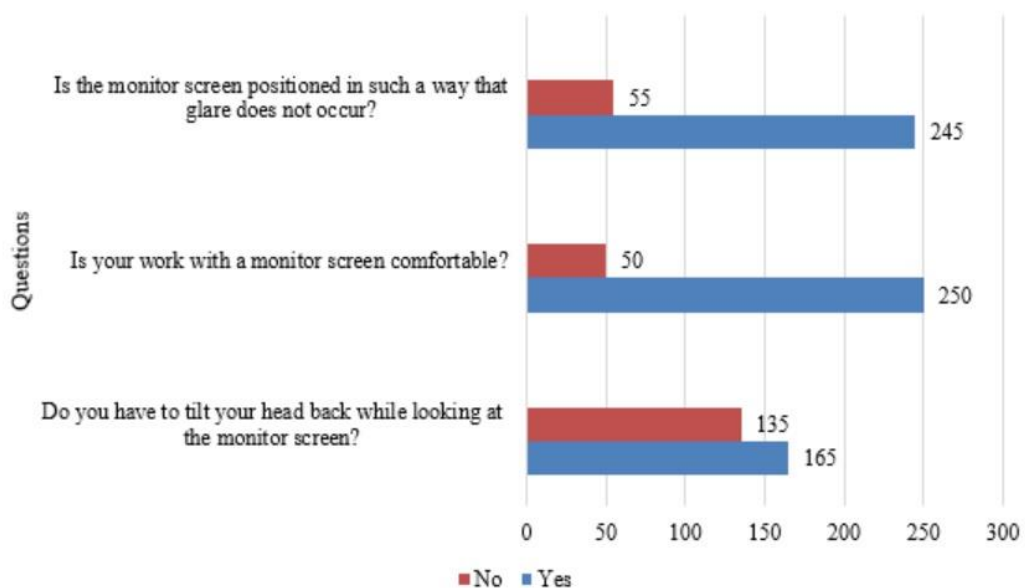


Fig. 3. Adjusting the monitor screen to the employee's needs

For most academic teachers working in a remote system at home, working with a monitor screen was comfortable. Such a state was declared by over 83% of the surveyed academic teachers. However, working with the monitor screen and positioning it in relation to the user's eyes is not compliant with the principles of ergonomics, as evidenced by the respondents' declaration. Almost every second lecturer tilts their head back while looking at the monitor screen. This is a phenomenon that has a negative impact on musculoskeletal disorders of the cervical section. Also, almost every second respondent has a monitor screen set in a way that causes glare and negatively affects both the user's eyesight and the quality of their work.

Respondents also answered questions about workplace conditions related to microclimate, lighting and noise. Positive declarations were recorded in these three cases. Working from home in terms of the physical factors of the working environment does not differ from the optimal conditions. Both temperature, lighting and noise did not occur in too high or low intensity and exposure to negatively affect the safety and health of the respondents.

However, the results of research on mental strain are different. Academic teachers, changing their working conditions to "home", had to face many factors that so far had not affected them in the working environment. These were primarily threats related to performing professional and social roles in one place and at the same time. Lack of balance between work and private life, excess of duties, overtime work associated with an increase in employee tasks. Figure 4 shows the respondents' declarations in the mentioned elements of mental burden.

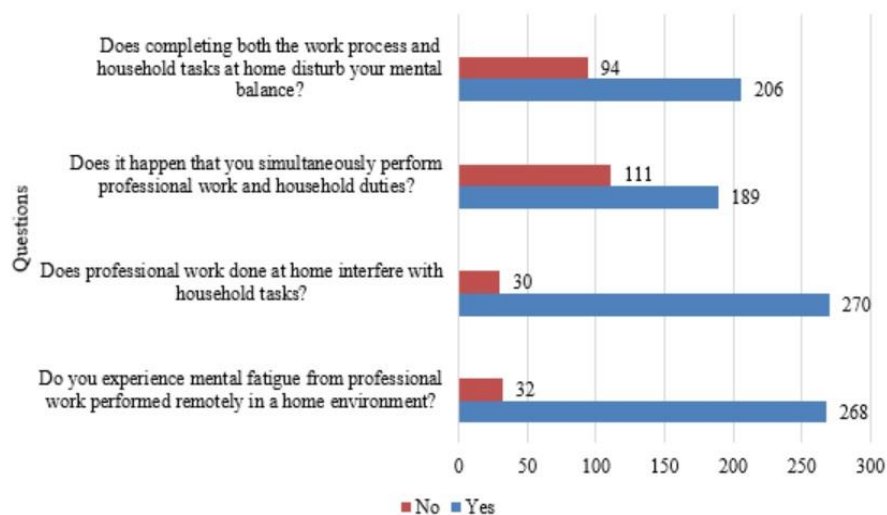


Fig. 4. Opinion of academic teachers on selected elements of mental strain

According to the above data, it turns out that academic teachers feel a mental imbalance caused by remote work and homework at the same time. This is indicated by over 68% of respondents. Almost all (about 90% of the respondents) academic teachers also felt mental fatigue caused by professional work, which was carried out remotely at home. One of the reasons could be that - in the opinion of the respondents (over 90% of the respondents) it happened that they performed both homework and professional work at the same time.

Administrative and office work in which there is a high exposure to a forced (sitting) position is accompanied by musculoskeletal disorders. So far (EU-OSHA studies before the pandemic) every fourth employee of the European Union has complained of such ailments. The pandemic, which has changed the working conditions of many professions, has contributed to an increase in statistical data regarding the number of people indicating musculoskeletal disorders as a result of sedentary work and psychosocial factors, which also contributed to the aforementioned disorders (according Report of European Agency for Safety and Health at Work). Among the surveyed academic teachers, there were people who indicated disorders of the musculoskeletal system as a result of too much exposure to remote work, forcing work sitting at the computer. Pain intensity was assessed by the respondents using a subjective VAS scale (Visual Analogue Scale). The results are presented in Table 1.

Table 1

Average ailments for individual parts of the body during the pandemic (remote work at home)

Ailments	Average rating
Pain in the cervical spine	6.00
Shoulder joint pain	4.17
Elbow joint pain	1.73
Wrist joint pain	3.83
Pain in the thoracic spine	5.96
Pain in the lumbosacral spine	4.67
Hip pain	2.16
Knee joint pain	1.20
Foot pain	1.45

The presented data show that the respondents felt the greatest pain in the cervical spine (6.00), in the thoracic spine (5.96) and in the lumbosacral spine (4.67). This may lead to the conclusion that such ailments result from the nature of the work performed. The forced sitting position and high time exposure to it cause most of the pain sensations in the indicated sections of the spine.

Taking into account the lack of optimal and ergonomic conditions for remote work carried out at home by academic teachers and the effects of these conditions in the form of musculoskeletal system ailments, it would be advisable to use all possible prophylactic and preventive measures to minimize the aforementioned disorders. In a direct interview via ClickMeeting, the respondents indicated activities that they undertake of their own free will and those proposed by the universities where they work. Well, the surveyed academic teachers unanimously admitted that preventive measures to minimize the effects of remote work are needed. None of the surveyed respondents denied this statement. Unfortunately, only half of the surveyed respondents admitted that they do relaxation exercises almost every day. Only 26% of the respondents admitted that they are physically active using the indoor swimming pool or yoga classes. At the same time, the respondents reported that most of their physical activity results from the admission ticket to various sports and recreation centers proposed by the university. Every fourth respondent combines their physical activity with the activity of the rest of the family. These are usually weekend bike trips

or hiking in the mountains. The research and teaching staff interviewed pointed to a number of activities of their university that support them in fighting the effects of the pandemic and remote work during this period. First of all, the university established a psychological help point for teachers. In addition, she offered free participation in yoga and fitness classes. Combining psychological support and an offer related to physical activity is a holistic approach that should be practiced by every company towards its employees. Unfortunately, not a few employees take advantage of this offer. The main reason for this phenomenon is indicated by the respondents as a heavy workload and household duties.

3. SUMMARY AND CONCLUSION

Remote work, which many professions were forced to do during the Covid-19 pandemic, is slowly taking its toll in the form of musculoskeletal disorders and psychosocial as well as mental disorders. As the latest EU-OSHA report shows, the causes of MSDs and psychosocial health are linked. Very radical changes in the working conditions of academic teachers (and not only), contact with students and colleagues via the Internet, lack of presence in the work group, high exposure to factors related to forced body position (sat for many hours at the computer), imbalance between professional and private life, performing home and professional tasks at the same time, strongly undermined the triad of employee health well-being. The change in the working conditions of academic teachers, i.e. the transfer of all scientific and didactic duties to home, resulted in many negative phenomena. Academic teachers complain about various ailments of the musculoskeletal system, e.g. cervical, thoracic and lumbar spine. In addition, in their opinion, remote work strongly disturbed the balance between professional and private life. Research has shown that despite various preventive activities that minimize the effects of remote work and are undertaken by both employees and universities themselves, it is not enough to prevent a large scale of diseases associated with post-pandemic ailments. Therefore, there is a great need to shape pro-health attitudes among employees, especially those working in administrative and office conditions. Effective actions are seen especially on the part of employers, but also on the part of the interested parties themselves. According to the principle of the triad of health well-being, attention should be paid to all its elements, taking care of the safety and hygiene of health of each employee - mental, social and physiological well-being.

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