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Adapting the workplace to the needs of older people as a challenge for industrial ergonomics

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SUMMARY

In Poland, as well as in the European Union as a whole, the percentage of older people is gradually increasing. This translates into an ageing workforce. Due to the lack of generational replacement, older Poles will be forced to continue working longer than their parents or grandparents. Unfortunately, the natural consequence of the aging of the body is a number of changes that make it difficult or even impossible to perform work. Age is one of the factors: reduced mobility and longer response times, reduced aerobic capacity or decreased sensory and sensory abilities. Older people suffer from a deterioration in their general state of health. However, age is one of the few, but not the only, risk factors for inability to work. This means that while it is not possible to deduct metric years, other factors that affect an employee's ability

to continue working may be modified. For this reason, ergonomic measures should have an impact on them and reduce their negative effects, thereby affecting the length and quality of working life of older people. The aim of this paper is to analyse the changes in the possibilities of working with age and to present proposals concerning the adjustment of the workplace to older people.

Keywords: ergonomics, safety at work, older workers, employability

Introduction

The age distribution of employees is a contractual concept. It is difficult to draw a coherent and clear line between the younger and the older group because of the multiplicity of factors and the changes on which they depend. The sense of entry into the older age bracket may result from the observation of such changes as, for example, the following:

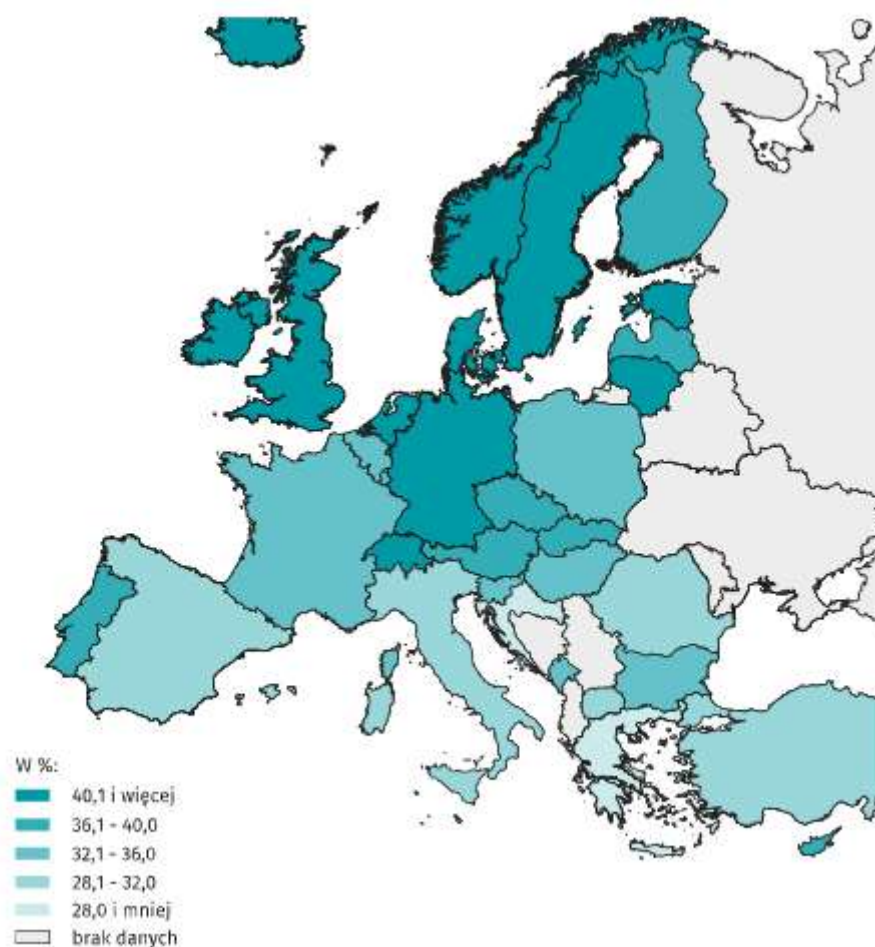
- Changes in the mental sphere - a moment of awareness that you are an elderly person. It can occur when colleagues retire and it is recognised that there are many younger colleagues in the team. In private life, the moment of death of parents may be such a moment, when the feeling of taking over the role of a family senior appears,
- Changes in the biological sphere - the moment of lowering, reaching a certain value of selected physiological functions of the body, including psychomotor functions, e. g. reduced response time,
- Changes in the legal and economic sphere - the moment of acquiring or losing certain privileges, e. g. : the moment of retirement, obtaining the right to discounts or free travels by public transport,
- Changes in the social sphere - the moment of changing social roles (loss of the current ones, acquisition of new ones). These changes are culturally determined and usually equated with consent to specific behaviours.
- Changes in the metric sphere - adoption of age ranges for specific groups of people is a simplified form of the above, most frequently used in demographic analyses due to the strict framework of allocation to particular groups. It is burdened with a considerable error, because depending on one's own character, mood and self-esteem, each employee may display the characteristics of several different age groups at the same time [1].

The process of reducing labour resources and their ageing is already well under way. This process will follow the ageing of the population, which is to be expected as the number of births decreases and life expectancy increases. On the Polish labour market, changes in the structure of labour resources by age and the process of economic deactivation of people in older age groups are clearly observed.

This leads to a number of negative consequences which should be counteracted. Currently, under the national law, activities conducive to the activity of people at pre-retirement age are:

- Reduction of costs for an employer of a long-term illness of an older employee - the employer's sick pay pays up to 33 days of illness, while in the case of people over 50 years of age it pays only up to 14 days.
- Employers employing women over 55 and men over 60 are exempt from the obligation to pay contributions to the Labour Fund and Guaranteed Employee Benefits Fund,
- Employing an unemployed person aged 50+, the employer may apply for free training for these people, as well as is exempt from the obligation to pay contributions to the Labour Fund and Guaranteed Employee Benefits Fund,
- Pursuant to Art. 39 of the Labour Code, the Polish legal system prohibits dismissal of an employee who lacks no more than 4 years to reach the retirement age. Unfortunately, although this assumption is correct, in practice it may lead to the opposite effect. Some employers lay off workers shortly before they reach the end of their protection period. Finding a new job by these employees is in many cases unrealistic, as the employer, by signing a contract with such an employee, undertakes not to dismiss him/her until the retirement age [2].

The statistics show that the effectiveness of the above mentioned solutions is low. The employment rate of people over 50 in Poland in the fourth quarter of 2017 was 42.0% for men and 25.8% for women. Among these countries, high employment rates of 50+ employees were recorded in Sweden (44.6%) and Estonia (44.1%), but also over 40% in Germany, the Netherlands, Lithuania, the United Kingdom, Denmark and Ireland. The high employment rate among men (above 49.0%) was in Estonia, the Netherlands, Sweden, Germany and Ireland, and among women (above 40.0%) in Sweden and Estonia. Among EU countries, 28 people aged over 50 worked the least in Greece (25.1%) (Fig. 1) [3].



[in % ; 40.1 and more ; ... ; 28.0 and less ; no data]

Fig. 1: Employment rate of people over 50 in European countries in the fourth quarter of 2017.

The presented data show that in our country there is a need to create a work environment friendly to the elderly. When designing ergonomics, it should be borne in mind that workstations and other technical facilities in a company must encourage older people to use them, otherwise there will be situations where older people, due to the lowering of their own requirements, are satisfied with lower incomes and give up their professional activity. The consequence of such a decision is often an unwitting permission to push oneself as an elderly person onto the margins of social life. In order to prevent this, it is necessary to adapt the workplace to the needs of older people.

The aim of this paper is to analyse the changes in the possibilities of working with age and to present proposals concerning the adjustment of the workplace to older people.

Changes in the possibilities of working with age and selected ergonomic recommendations for working with older people

Usually, the ability to work decreases with age. A significant decrease in the WAI result is observed among nearly one third of the European workforce aged 45+. However, there are also some older workers who have good or excellent working ability. This is due to the fact that the population of older workers is more heterogeneous than the younger generation. With age, individual differences in work ability increase[4]. The literature on the subject draws attention to the fact that it is a mistake to set a fixed age limit between those who are able to work and those who have lost their ability. The state of health and the process of ageing are individual for each person, they differ even in the case of twins. There are many individual predispositions to develop diseases and injuries and to perceive one's own health in physical, mental and social terms. Depending on their own character, well-being and self-esteem, each employee may exhibit the characteristics of several different age groups at the same time. For example, an employee who according to the chronological age is 55, may feel like in 50 years of age (psychological age), behave like a forty-year-old (social age), and be able to behave like in 45 years of age (functional age). There is no doubt, however, that aging is a continuous and inevitable process, and with it numerous changes taking place in the body that affect the ability to work [5-6].

As a result of the aging of the body, the elasticity and tensile strength of ligaments and tendons decreases. The mobility is reduced and the regeneration time of damaged tissues is prolonged. Approx. At 40, bone density decreases, making it more susceptible to fractures. Within the musculoskeletal system, annoying pains occur, which are among the most common complaints among professionally active Poles. In many cases, these ailments occur or worsen as a result of inadequate working conditions [7]. A representative survey conducted in 2013, entitled "The European Year of Volunteering. "Accidents at work and work-related health problems" showed that disorders of the locomotor system constitute as much as 67.7% of all work-related ailments in Poland [8]. They are common among nurses [9], physiotherapists [10], dentists [11], farmers [12] and call center employees [13]. Occupational factors influencing the degree of pain sensation within the musculoskeletal system include: non ergonomic workstations, cold microclimate or long-term sitting. Short breaks should be provided to allow persons, in particular the elderly, to change their posture. Often, pain occurring in employees in different parts of the musculoskeletal system and constituting difficulties in determining the somatic cause has its origin in a high psychophysical workload [14-16]. This is why it is so important to adapt working conditions to older workers. Such

workers should avoid repetitive work that requires a torso to be twisted during lifting, or that requires a lot of physical effort. As you grow older, your strength capacity decreases - more so in the lower limbs than in the upper limbs. This leads to slower walking times, a slower pace of physical work and less precision. A decrease in muscle mass and strength results in more frequent falls, which in the workplace may cause accidents [17]. Low physical endurance among older workers is not a universal principle. It also happens that some active seniors are stronger and more capable than younger colleagues, especially than those who, despite their young age, lead sedentary lifestyles. The reluctance of the Polish population to engage in physical activity will make health problems in the musculoskeletal system more common. Nowadays, outdoor games are being replaced by watching TV or serving on the Internet for many hours among children. In several years' time, the same people will constitute the labour force in our country and due to the lack of replacement of generations they will be forced to work longer than their parents and grandparents, which in the context of their anti-health behaviours may prove impossible to achieve [18].

Adequate oxygenation of the body is essential for proper work. Unfortunately, oxygen capacity decreases on average by 10% for every decade of life, and as a result: minute capacity of the heart, maximum capacity of breathing and maximum oxygen uptake are reduced. A decrease in cardiopulmonary capacity reduces oxygen supply, workers tolerate hard physical work less, the brain is not fully oxygenated, the reaction slows down, dizziness occurs. Changes in the cardiovascular system with age interfere with the ability to regulate body temperature. It is difficult to adapt to extreme temperatures, so older workers should not work in hot, humid or cold working environments. Shift work is also not recommended [19].

As a result of the ageing process, sensory and sensory abilities decrease. Of all the senses, changes in visual perception are observed at the earliest. Older people are characterised by: farsightedness, impairment of their ability to distinguish between colours, distances and speeds of moving objects, visual impairments in low light, twilight, fog or clouds, low vision thresholds (poor visibility), poor ability to regain vision after blinding, and a reduced field of vision width. All these changes are particularly important in professions that require special attention and attention to detail, while driving at night or reading printed documents, disks, screens. In order to minimise the risk of accidents as a result of visual impairments and to make it easier for older workers to carry out their occupational activities, appropriate lighting conditions should be provided. It is not advisable to use blue shades at the workplace or to combine blue with green and blue with black. Wherever possible, it is worth eliminating the need for older workers to

move between well-lit and poorly lit rooms and reducing night work. All signs in the workplace should be visible, clear and legible also for older people [20].

The sense of hearing also deteriorates in old age. Old hearing loss makes high pitched sounds suppress or tear apart, tinnitus makes it difficult to receive signals and locate their source. Communication between employees is becoming more difficult. This is particularly uncomfortable in team-intensive occupations and in areas where there is a risk of sound alert. In the workplace, it is necessary to control the noise level and eliminate echoed areas [21].

As you age, the sensitivity of the sense of touch decreases. The feeling of warmth, cold, pressure and vibration is reduced. The pain threshold is increased, and low intensity pain stimuli become imperceptible. The skin loses its elasticity, becomes thin and dry, more susceptible to inflammation. It therefore needs special protection when handling chemicals. In older people, wounds heal up to four times longer than those of young people. Degenerative changes also occur within the sensory cells and receptors responsible for the sense of equilibrium. The increased risk of falling is particularly dangerous for firefighters and other emergency services, for construction workers and for all others who work at heights. In order to protect the health and life of older employees, it is advisable to light passages, mark stairs and uneven areas with highly contrasting signs [22].

At an older age, odour can be reduced or completely lost or, on the contrary, it can become excessively pronounced. The sense of taste is also distorted, mainly the ability to feel bitter and salty. All of these changes in the senses limit the range and accuracy of external stimuli received by the brain. The brain itself also integrates the sensory information transmitted by the sensory cells more slowly. The entire nervous system slows down. There are minor changes in the way information is processed and how memory functions. Short-term memory deteriorates, fatigue occurs faster and more often, and there is a greater need for sleep and rest. The sleep pattern also changes, so older workers should not work at night or in shifts of age. Age, however, is not the only factor influencing a person's cognitive functioning. They are largely influenced by experience and many years of practice. The organisation of training and the promotion of personal development can significantly improve the ability to perceive and remember [23].

Older workers tend to avoid risks and their activities are more systematic and systematic. On the basis of their experience, knowledge and wisdom they are better able to solve real life problems. Adapting the workplace to the needs of older people can enable them to enjoy a long and productive working life. The professional usefulness and results of work very often depend on knowledge and experience, and to a lesser extent on the age of the employee [24].

Conclusion

The ageing of the workforce is becoming unavoidable as it is a consequence of demographic changes and socio-economic developments. For workers to be able to work in good physical and mental health until retirement, attention must be paid to creating good working conditions, a good work-life balance, job security and lifelong learning opportunities. For this reason, it is extremely important that both corrective and conceptual ergonomics take into account the changes occurring under the influence of an aging body. It is crucial to understand and accept the challenges of an ageing workforce in relation to health and safety at work.

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