Assessment of knowledge of ergonomic principles and their application among office workers in corporations

Ocena znajomości zasad ergonomii i ich zastosowania wśród pracowników biurowych w korporacjach

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Abstract

Purpose: The purpose of the paper was the assessment of knowledge of ergonomic principles and their application
among office workers in corporations.

Material and methods: The study involved 105 persons, office workers from corporations from all over Poland, including 57 males (55.2%) and 48 females (44.8%), aged 20 to 56. For the purposes of the study, an original questionnaire was developed, consisting of 26 questions and particulars, which was used to examine the knowledge and opinions of office workers in corporations about the principles of ergonomics and their application in the workplace of the respondents, and also it allowed to assess the actual state of adaptation of office equipment elements according to ergonomic principles.

Results: In the group of employees surveyed, 97 persons (92.4%) encountered the concept of ergonomics, 76 persons (73.3%) knew the principles of office workstation ergonomics, while 77 persons (72.4%) thought that they were never offered to adapt the workstation to their individual needs. According to the respondents, the most frequent sources of acquiring knowledge about ergonomics of work at an office workstation were OHS training sessions (78 persons, 74.3%), Internet (43 persons, 41%) and literature (38 persons, 36.2%).

Conclusions: The age of the respondents had a significant impact on their knowledge of the principles of ergonomics at an office workstation. The source of knowledge acquisition by respondents about the principles of ergonomics of an office workstation did not affect their opinion on who should deal with the adaptation of the office space. According to the opinion of the surveyed office workers, a computer mouse was the least-adapted office equipment element in terms of ergonomics.

Keywords: ergonomics, office work, corporation

Introduction

Work plays a very important role in everyone's life. It fulfills an important function in the organization and development of not only individuals but also social groups. It is estimated that work takes about 2/3 of the average adult's life. That is why it is important that the workstation is well-suited for the individual needs of each person. A well-shaped workplace influences not only the quality of performed activities, but also the mental and physical well-being of an employee [1, 2].

People who spend almost the whole day of their work behind the desk and in front of the computer, have a limited field of physical activity, and also expose themselves to the danger of radiation of electronic devices that surround them. After a full day of work, people working behind the desk most often complain of back pain and headache, neck pain and shoulder tension. To a large extent, this is due to inadequate organization of space and failure to comply with ergonomic recommendations at the workstation [1, 3–6]. Office work rooms are to enable employees to have hygienic and safe working conditions. Well-suited ergonomically selected furniture and computer equipment allow you to adopt a non-straining body position, which is very important during a few hours of work behind the desk. The ideal situation is matching furniture to the individual needs of each employee, but there are also general, basic recommendations for standard equipment, which include not only the dimensions of the room or furniture itself, but also standards regarding temperature, humidity and lighting [5, 6].

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All the aforementioned elements have a significant impact not only on work safety, but also on comfort, convenience, satisfaction and well-being of employees [1, 3–13].

The employer is the party who should particularly take care of safe, hygienic and ergonomic working conditions. It is responsible for the state of occupational health and safety in the workplace. The employer's duty is to protect the health and life of employees, so it must ensure that the workplace complies with OHS regulations, control the implementation of instructions related to it, and immediately remove any deficiencies in this regard. Unfortunately, very often it happens that when organizing an office workstation, the principles of ergonomics are treated in a marginal way or are completely omitted. This is a big mistake, because a properly designed office workstation, arranged in an ergonomic way, improves employee efficiency, improves health and well-being, reduces the number of accidents and occupational risk, reduces the costs due to employee absence, as well as hinder creative thinking [4, 5]. It is important that not only the employer, but also an employee are aware of the importance of individual adaptation of the workstation, because a well-adapted position in the office benefits both employees and the employer [1].

Material and methods

Persons under study

105 persons were surveyed, including 57 males (55.2%) and 48 females (44.8%). All respondents were employees of corporations from all over Poland. The respondents were divided into 4 age groups. In the first group (20–30 years) there were 72 persons (69.5%), in the second group (31–40 years) there were 28 persons (25.7%), in the third group (41–50 years) there were 4 persons (3.8%), while in the fourth group (51 and more years) there was only 1 person (1%)

The respondents most often indicated a city with over 100,000 inhabitants (50 persons, 48.6%) as their place of permanent residence. Next, the respondents indicated a countryside (22 persons, 21%), in the third place – a city from 25,000 to 100,000 inhabitants (20 persons, 19%), the least frequently respondents lived in towns up to 25,000 inhabitants (13 persons, 11.4%) .

Study methods

The sample for the study was selected in a non-probabilistic (intentional) manner. The sampling method was used, which is based on data availability, that is: in the workplaces of office workers (in corporations) and the snowball method, where office workers who were successfully reached were asked to pass the questionnaire to friends working in corporations. The criterion for inclusion in the study was currently held an office worker position in a corporation.

For the purposes of the study, an original questionnaire was developed, consisting of two parts and particulars. Part I, consisting of 12 questions, was used to check the knowledge and opinions of office workers in corporations about the principles of ergonomics and their application in the workplace of the respondents. Part II, containing 14 statements, allowed to assess the actual state of adaptation of office equipment elements according to ergonomic principles, such as: furniture, computer, lighting or air conditioning.

Descriptive statistics methods (numbers and percentages) and statistical analysis were used to process the collected data. The chi-square test was used and the adopted significance level was $p = 0.05$. The above calculations were made using Statistica version 12.

Results

Descriptive statistics

In the group of employees surveyed, 97 persons (92.4%) encountered the concept of ergonomics. Eight persons (7.6%) have not heard of this concept. Among the respondents, 76 persons (73.3%) knew the principles of office workstation ergonomics, while 29 persons (26.7%) admitted that they did not know these principles. Among the respondents, 77 persons (72.4%) believed that they had never been offered to adapt their workstations to their individual needs, while 28 respondents (27.6%) said that they had gotten such a proposal. Most of the respondents considered that adjusting the office workplace according to the principles of ergonomics is very important (48 persons, 45.7%) or important (46 persons, 42.8%), only a few people had no opinion on this issue (8 persons, 7.6%), considered the matter to be unimportant (2 persons, 1.9%) or irrelevant (1 person, 1%).

According to the respondents, the most frequent sources of acquiring knowledge about ergonomics of work at an office workstation were OHS training sessions (78 persons, 74.3%), Internet (43 persons, 41%) and literature (38 persons, 36.2%). The respondents were much less likely to acquire such knowledge from television (7 persons, 6.7%) and in college (4 persons, 3.8%). Among the respondents, the rarest sources of acquiring knowledge on this subject were, among others, work, training, seminars, leaflets, advertisements, brochures, presentations and more (1 person each, 1% respectively).

Respondents were also asked who they thought should deal with the adaptation of workplaces for office workers in accordance with the principles of ergonomics. The most frequently given answers included an OHS employee (58 persons, 55.2%), a physiotherapist (53 persons, 50.5%), an occupational therapist (44 persons, 41.9%) and an interior designer (33 persons, 31.4%). Among the remaining answers, the respondents pointed to, among others, employee, manager or purchasing department.

The respondents were also required to refer to statements regarding specific standards and principles of ergonomics of office work in relation to their own workstation. The distribution of answers to selected questions is presented in Table 2.

Table 1.

Distribution of answers to questions about selected aspects of ergonomics in office work

	How do you assess the adaptation of your workplace to your needs?		How do you assess the readiness of your employer to adapt office workstations according to the principles of ergonomics?		How do you assess your knowledge of principles of ergonomics at an office workstation?	
	N	%	N	%	N	%
Very good	22	22.9	21	21	13	12.4
Good	51	45.7	29	27.6	43	40
Average	20	20	36	33.3	36	35.2
Poorly	9	8.6	17	16.2	11	10.5
None	3	2.8	2	1.9	2	1.9

Table 2.

Distribution of answers to selected questions about the principles of ergonomics in office work in relation to the own workstation of the respondents

	Yes		No		I do not know	
	N	%	N	%	N	%
The desk at my workstation has dimensions of at least 100×80 cm	77	73.3	11	10.5	17	16.2
The height of the top of my desk is adjustable	35	33.3	65	61.9	5	4.8
The chair I sit on during work has an adjustable seat	94	89.5	10	9.5	1	1
The chair I sit on during work has an adjustable backrest	68	65.7	32	29.5	5	4.8
I have a footstool at my workstation	16	14.3	88	84.8	1	1
Under my desk at my workstation, I have enough space to position my legs properly	93	88.6	11	10.5	1	1
My workstation covers an area of at least 13 m^2	29	27.6	48	45.7	28	26.7
I have enough space for my documents on my desk	88	82.9	16	16.2	1	1

Table 3.

Distribution of answers to selected questions about the office equipment in office work in relation to the own workstation of the respondents

	Yes		No		I do not know	
	N	%	N	%	N	%
The screen and keyboard of the computer at my workstation are straight ahead	87	82.9	17	16.2	1	1
The computer screen at my workplace is set 1.5 to 2 diagonally from the eyes.	55	54.3	25	22.9	25	22.9
The computer mouse at my workplace was selected individually	12	11.4	92	87.6	1	1
While typing, I have the option to rest my wrists	75	71.4	29	27.4	1	1
My workplace is illuminated by natural and artificial light	95	90.5	9	8.6	1	1
I have air conditioning in my workplace	87	82.9	17	16.2	1	1

Respondents were asked to refer to statements regarding the ergonomics of office equipment in relation to their own workstation. The distribution of answers to selected questions is presented in Table 3.

Statistical analysis

The impact of age on the knowledge of work ergonomics among the respondents was examined. On the basis of the test, a significant relationship between age and knowledge of ergonomics was found. Younger people had significantly more knowledge about work ergonomics than older people.

The impact of the source of knowledge on work ergonomics on the opinion of who should deal with the adaptation of office space was also examined. Based on the test, no significant relationship was found between the source of acquiring knowledge about work ergonomics and the opinion of who should deal with the adaptation of office space.

Discussion

Nowadays, office work has become one of the more frequently performed professions, and the sitting position adopted during it is almost the only way for many employees to practice their profession. Although for many people the sitting position is comfortable, it causes a significant strain on, among others, spine, rapidly worsening when staying in that position for longer, especially in non-ergonomic conditions. That is why it is so important that office employees not only have working conditions in accordance with the principles of ergonomics, but also they know its principles themselves and are able to recognise even the basic hazards arising from the lack of their application. Bartuzi and Kamińska [14] developed a questionnaire, which consisted of forty closed-ended questions, with the help of which employees assessed their knowledge of the ergonomics of a computer station. The highest number of respondents (42%) indicated – on a scale of 1 to 10 – the answer „5", which means that they rated their own knowledge of principles of ergonomics as average. Pawlak, Buczaj and Pecyna [15] also conducted a study on a similar topic. It turned out that in a group of forty persons, as many as 75% of the respondents declared that they knew the concept and principles of ergonomics of an office workstation. Smolis-Bąk et al. [16] surveyed 136 people working at computer workstations using a original questionnaire consisting of 32 questions. Their study showed that most of these people knew according to what principles of ergonomics an office should be designed. The results of own study correspond with the results of the aforementioned authors. After conducting studies in corporations, it was noticed that the vast majority of employees knew the principles of ergonomics at an office workstation.

Table 4.

Cross-table of age and knowledge of the principles of ergonomics at the office workstation

	20–30		31–40		41–50		50+		Total
	N	%	N	%	N	%	N	%	
Yes	59	77	17	22	1	1	0	0	77
No	14	50	10	36	3	11	1	4	28
Total	73		27		4		1		105
p	0.112								

Table 5.

Cross-table of the source of knowledge on principles of work ergonomics and the opinion of who should deal with the adaptation of office space

	OHS training		Interior designer		Occupational therapist		Physiotherapist		Other person		Total
	N	%	N	%	N	%	N	%	N	%	
Television	3	19	4	25	5	31	3	19	1	6	16
The internet	19	22	15	18	21	25	24	28	6	7	85
Literature	15	16	11	12	26	28	30	33	10	11	92
Training OHS	48	31	23	15	34	22	38	25	11	7	154
Other	9	23	4	10	13	33	8	21	5	13	39
Total	94		57		99		103		33		386
p	0.5191										

Due to the progressing computerisation, the number of jobs at computer workstations is growing. Therefore, it is worth considering whether, in the opinion of people performing this type of work, a suitably adapted office workplace affects the quality of life and work of office workers. Amick et al. [17] proved in their study that the adaptation and appropriate adaptation of office equipment elements significantly increase the satisfaction and quality of work of office workers. Bohr's studies [18] have shown that knowledge on ergonomics and a well-chosen office workstation are related to the better mood of the respondents. The results of the study conducted by Ketola et al. are also interesting [19]. They examined 124 Finnish office workers and proved that in the opinion of those persons, proper adaptation of the office affects job satisfaction and the feeling of being less fatigued. The conducted own study also showed that more than half of the persons participating in the survey stated that the quality of life and work depends on a suitably adapted workstation.

The chair is one of the basic elements of furnishing an office workstation, because the employee spends most of his/her time on it. The ergonomic chair must have adjustable backrest and seat. Gembalska-Kwiecień and Ignac-Nowicka [20] conducted a study on the ergonomic equipment of the office and showed that 82% of the respondents had a chair with adjustable seat. Over half of the respondents (53%) could adjust the backrest. Based on the conducted own study, similar conclusions were drawn. Almost all respondents had the opportunity to adjust the seat of their computer chair.

Considering the fact that the employer is responsible for ensuring appropriate working conditions for its employees, it is worth paying attention to how subordinates assess their employer's readiness to adapt office workstations according to principles of ergonomics. Hagg's studies [21] have shown that employers are not willing enough to adapt offices, as ergonomics is not an integral part of the overall strategy of the company for them, but it is only seen as a safety issue and is not related to the core values of companies. In contrast, Pawlak, Buczaj and Pecyna [15] have shown that 55% of employers are open and ready for adaptation, and they replace office equipment every five years. The results of own study showed that the majority of corporate employees confirmed that their employers were willing to adjust office workstations in accordance with the principles of ergonomics, however only 1/5 of them rated this readiness as very good.

Conclusions

1. The age of the respondents had a significant impact on their knowledge of the principles of ergonomics at an office workstation. Younger people had definitely more knowledge on this subject than older people holding the same position.
2. The source of knowledge acquisition by respondents about the principles of ergonomics of an office workstation did not affect their opinion on who should deal with the adaptation of the office space.
3. According to the opinion of the surveyed office workers, a computer mouse was the least-adapted office equipment element in terms of ergonomics.

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Streszczenie

Cel: Celem pracy była ocena znajomości zasad ergonomii i ich zastosowania wśród pracowników biurowych w korporacjach.

Materiał i metody: Badaniom poddano 105 osób, pracowników biurowych z korporacji z całej Polski, w tym 57 mężczyzn (55,2%) i 48 kobiet (44,8%), w wieku od 20 do 56 lat. Na potrzeby badań została stworzona autorska ankieta, składająca się z 26 pytań oraz metryczki, która posłużyła do zbadania wiedzy i opinii pracowników biurowych w korporacjach na temat zasad ergonomii oraz ich zastosowania w miejscu pracy osób ankietowanych, a także pozwoliła na ocenę faktycznego stanu dostosowania elementów wyposażenia biura według zasad ergonomii.

Wyniki: W grupie badanych pracowników 97 osób (92,4%) spotkało się z pojęciem ergonomii, 76 osób (73,3%) znało zasady ergonomii stanowiska biurowego, natomiast 77 osób (72,4%) uważało, że nigdy nie zaproponowano im dostosowania stanowiska pracy do indywidualnych potrzeb. Do najczęstszych źródeł pozyskiwania wiedzy na temat ergonomii pracy na stanowisku biurowym wg ankietowanych osób należały szkolenia BHP (78 osób, 74,3%), Internet (43 osoby, 41%) oraz literatura (38 osób, 36,2%).

Wnioski: Wiek badanych miał istotny wpływ na ich wiedzę na temat zasad ergonomii na stanowisku pracy biurowej. Źródło pozyskiwania wiedzy przez ankietowanych o zasadach ergonomii stanowiska biurowego nie wpływało na ich opinię na temat tego, kto powinien zajmować się dostosowaniem pomieszczeń biurowych. Według opinii badanych pracowników biurowych elementem wyposażenia biura w najmniejszym stopniu dostosowanym pod względem zasad ergonomii była myszka komputerowa.

Słowa kluczowe: ergonomia, praca biurowa, korporacja