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SOCIAL AND DEMOGRAPHIC FACTORS IN SHAPING THE PERCEPTION OF WORK AS A SOURCE OF HEALTH AND SAFETY RISKS: A STUDY ON ADULT EUROPEANS

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ABSTRACT: The aim of this article is to assess the impact of selected social and demographic factors on the perception of European adults regarding their workplace as a health and safety risk. This aligns with the sustainable development concept, which emphasizes labor rights protection and a safe working environment. Sustainable work is defined as work that doesn't compromise employees' physical or mental health over time. Utilizing data from the 2021 European Working Conditions Survey, which covered over 70,000 individuals across 36 countries and was conducted via CATI due to the pandemic, the study employs logistic regression. It analyzes three models: one encompassing all European countries, and two focusing on Eastern and Central European countries. The findings demonstrate that factors such as company size, age, occupational group, sector, employment nature, gender, service length, and education significantly influence workplace risk perception. International comparisons highlight differences in these factors across country groups, contributing to the scientific discussion in social sciences.

KEYWORDS: sustainable development, health and safety at work, European Working Conditions Survey, logistic regression

Introduction

The ambitious plans for the development and transformation of the world, as defined by the 2030 Agenda for Sustainable Development and its 17 goals, include economic and social challenges in addition to global climate challenges (Skvarciany et al., 2021; Brodny & Tutak, 2023). Among them, the protection of workers' rights and the promotion of a safe working environment plays an important role. Sustainability, understood as a process that takes into account the impact of business decisions on the environment, economy and society, is a new trend in research on working conditions and workplace safety (Mondi Group, 2013; Molamohamadi et al., 2013). Shaping optimal working conditions in accordance with the principles of occupational health and safety is one of the key factors implemented as part of this approach (Eurofound, 2015). However, as the literature emphasises (Amponsah-Tawiah, 2013), the role of occupational health and safety in the context of sustainable development is generally not sufficiently considered.

Workplace accidents, which have a key impact on the well-being of workers and impose significant costs on health and social systems in every country, are an important part of the discussion on sustainability. Studies show that these disruptions, which can be estimated by lost work hours and production delays, can affect the quality of a company's product (Loke et al., 2013) and its reputation (Marhavilas et al., 2018). Also, the literature (WHO, 1994; WHO, 2012) emphasises that safe workplaces and healthy employees are prerequisites for productivity as well as social, economic, and sustainable development. In this context, employees' health is at the heart of sustainable development, with an emphasis on the fact that the health and productivity of the workforce affect the health and well-being of entire families and communities.

In the era of globalisation and the complexity of the modern labour market, the issue of the impact of work on the health and safety of individuals is gaining importance. In recent years, there has been a growing research trend related to the topic of the influence of work on health and safety, which is primarily due to global changes in employment structures, work processes and the impact of pandemics on working conditions (Ravalier et al., 2023; McFadden et al., 2022; Svabova et al., 2021; Privara, 2022; Kramarova et al., 2022). The increasing intensity and pressure of work, as well as the increasing uncertainty associated with the labour market, are affecting the mental and physical health of employees (Bhattacharya & Ray, 2021; Johnson et al., 2005). This phenomenon has significant consequences for both individuals and society more broadly, resulting in increased health and absenteeism costs (Santini et al., 2021; Van der Noordt et al., 2014; László et al., 2010). In addition, the findings suggest that the level of work-related health risks varies according to social and economic contexts (Boschman et al., 2013), which indicates the need for more complex analyses

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that take into account the diversity of factors affecting health and safety in the workplace (Nordlöf et al., 2017).

Despite a wealth of research on the impact of work on health and safety, there is a research gap with regard to the various social and demographic factors influencing the perception of labour as a source of risks. Research to date has focused on single aspects, neglecting a holistic approach that takes into account a wide range of factors that influence the perception of work as a risk to physical and mental health (Houdmont et al., 2012). This paper seeks to fill this gap by providing new insights into how various factors, such as gender, age, education, socioeconomic status, and the sector of employment, influence perceptions of work as a source of risk. This knowledge makes it possible to compare these factors at the international level, which is key to developing effective strategies and policies to improve the working conditions and health of employees around the world.

Noting the previously described health and economic consequences associated with working conditions, the need for a deeper understanding of this issue becomes even more important. In this context, the main objective of this paper is to assess the impact of selected social and demographic factors on European adults' perceptions of work as a source of health and safety risks. Understanding how these factors affect perceptions of work can lead to better strategies to prevent accidents and improve the overall health of workers.

The realisation of the main objective is subordinated to two specific objectives. The first of these (Objective 1) focuses on identifying factors influencing the perception of health and safety risks in the workplace. Such a goal is both theoretical and applied, as understanding these factors is key to developing theory on the subject as well as practical recommendations for employers and policymakers. The second specific objective (Objective 2) focuses on identifying differences and similarities in perceptions of workplace health and safety risks across international cross-sections. This objective is of clearly applied character, as the results can be used to improve the working conditions and health of employees around the world, taking into account the specifics of different cultural and socioeconomic contexts. Thus, our research contributes to the social sciences by developing and testing models of perceiving the workplace as a source of threat to health and life encompassing demographic factors (age, gender, length of service, and education) and factors characterising the respondents' place of work (i.e., the size of the company, the sector of activity, the occupation and nature of occupation/status in the labour market). All these factors proved to be significant in all three models, i.e., all analysed countries (the EU Member States and the associated countries), Eastern European Countries, and Central European Economies. Taking into consideration cultural aspects gives rise to undertaking real and targeted practical actions to improve working conditions and health protection in the workplace.

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The paper consists of the following sections: the literature review, the data and research methods section, the presentation of results of logistic regression models, the discussion, and the conclusions.

Literature review

Sustainability, based on a three-pillar model, is increasingly being included in research and organisational practices, especially in the context of safety and working conditions. It derives from the idea of balancing the economic, social and environmental dimensions, which is particularly relevant in the area of labour (Elkington, 1997). In this way, occupational health and safety becomes not only a matter of risk management and regulatory compliance but also a key element in the pursuit of sustainable development (Senge et al., 2008; Ehnert et al., 2014; WCED, 1987).

Risk is defined as a situation or event in which something of human value is at stake and the outcome is uncertain' (Rosa, 1998; Rosa, 2003; Fragouli & Theodoulou, 2015; Aven, 2010). However, some risks may worry or alarm people, while other risks may be intentionally or unintentionally ignored by individuals and societies. Understanding risk is based on psychological, cultural and socially structured conceptions of the world. In psychological science, risk perception is a set of concepts on the basis of which people form their own sources of risk in relation to the information available to them and basic common sense (Aven & Renn, 2010). It should be emphasised that people's behaviour is not based on facts but primarily on perception. Psychologists say that perceptions are shaped by factors such as social communication, personal dimensions and cultural traditions (Fragouli & Theodoulou, 2015). This means that people's perceptions of risk are multidimensional, and specific risks have different meanings, nature and contexts for different individuals (Slovic, 2016).

The multidimensional nature of risk has become a social, political, economic, legal, and ethical issue. The attitude toward risk stems from the emergence of a new sensitivity to the fragility of technological devices from a number of recent events that have undermined the confidence placed in science and technology. Moreover, late modernity is characterised by reflexivity (Solé, 1998; Urteaga & Eizagirre, 2013) in social spheres such as emotional, family and professional life. For Beck, clarity in anticipating risk and uncertainty is a fundamental cultural aspect, both in the biographical and political spheres (Beck, 2001).

When analysing the issue of risk, it is worth noting that this is an area of research that involves a number of different scientific disciplines. Such interdisciplinarity largely contributes to the lack of a universal definition of risk, forcing researchers to operationalise and adapt it to the specifics of a given context and subject of research. This causes difficulties in establishing a transdisciplinary

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characterisation of risk (Trillo-Cabello et al., 2021; Urteaga & Eizagirre, 2013; Ključnikov et al., 2022).

Theoretical studies of risk perception show that this construct can be approached from a structural perspective, which focuses on the perception of risk associated with actual situations. Based on this approach, Slovic et al. (1982) sought to find out what citizens consider risk and why, develop a theory of risk perception so one can predict reactions to new risks, and develop techniques to assess the complex and subtle opinions people have about risk.

Risk perception is a phenomenon that requires explanation (Sjöberg, 2003; Hawkes & Rowe, 2008; Bonem et al., 2015; Trillo-Cabello et al., 2021). It has evolved from being seen as a product of society's lack of awareness to a complex problem that is being studied by many specialists in various disciplines, such as psychology, sociology and engineering (Prades López, 1999; Trillo-Cabello et al., 2021; Virglerova et al., 2021). Risk perception morganis, therefore, a social process and is itself a cultural construct (García Acosta, 2005; Trillo-Cabello et al., 2021).

Socio-historical analysis allows us to conclude that risk perception is primarily a social representation. It appears in different forms depending on society, era, social category or gender, as women's fears differ from men's. It explains a range of fears more or less shared in the social community. 'True' results are viewed according to social values and interests (Shrader-Frechette, 1994; Luhmann, 1993; Fragouli & Theodoulou, 2015). However, all sociological and anthropological conceptions of risk share the common view that 'people do not perceive the world with pristine eyes, but through perceptual lenses filtered by social and cultural meanings transmitted via primary influences such as the family, friends, subordinates, and co-workers' (Fragouli & Theodoulou, 2015).

Employees' perceptions of workplace risks and hazards are influenced by many factors. The perception of safety and risk in the workplace has been studied by many researchers, but usually not as a separate research problem, but as part of research related to the study of the causes of workplace accidents (Morgan et al., 2019; Ajslev et al., 2017; Meliá et al., 2008; Memarian & Mitropoulos, 2013), safety culture (Nelson & Zega, 2021; Fragouli & Theodoulou, 2015; Ajslev et al., 2017), risk behaviour (Chaswa et al., 2020; Wang et al., 2019), or the functioning of OSH management systems (Niciejewska & Kiriliuk, 2020). The conclusions of the research often took into account demographic factors (age, gender, length of service, and education) as well as cultural and social factors. A synthetic summary of the variables taken into account in research studies on various aspects of OSH is presented in Table 1.

The results of an extensive literature review are shown in Table 1, demonstrating the variety of factors considered by other researchers.

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Table 1. Occupational health and safety studies considering demographic social characteristics of respondents

Author	Social, demographic and other factors												
	sector/country	A	B	C	D	E	F	G	H	I	J	K	L
Abbas et al. (2018)	Construction Lebanon						+		+				
Ahonen and Benavides (2006)	Various sectors Spain				+	+							
Ajslev et al. (2017)	Various sectors Denmark	+											
Ali-Saleh & Halperin (2022)	Households Israel					+							
Chan et al. (2017a)	Construction Hong-Kong					+	+						
Chan et al. (2017b)	Construction Hong-Kong					+				+	+	+	
Chaswa et al. (2020)	Construction Malawi	+	+	+	+		+		+				
Domínguez et al. (2021)	Manufacturing Mexico						+		+				
Eiris et al. (2020)	Construction USA			+									
Hallowell (2010)	Construction USA						+						
Han et al. (2019)	Construction China	+	+		+		+						
Hung et al. (2011)	Construction USA						+						
Ibrahim et al. (2022)	Construction USA	+	+	+	+	+	+						
Karimi and Taghaddos (2019)	Construction Iran		+						+				
Lesch et al. (2009)	Students USA/China					+							
Meliá et al. (2008)	Construction England/China/ Spain						+						
Memarian and Mitropoulos (2013)	Construction USA						+						
Meng and Chan (2020)	Construction China	+	+		+		+		+				

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Author	Social, demographic and other factors												
	sector/country	A	B	C	D	E	F	G	H	I	J	K	L
Morgan et al. (2019)	Households England	+											
Mučenski et al. (2015)	Construction Serbia	+							+				
Namian et al. (2016)	Construction USA	+		+									
Nelson and Zega (2021)	Mining Indonesia			+									
Niciejewska and Kiriliuk (2020)	Manufacturing/ services/commerce Poland	+											+
Ricci et al. (2021)	Construction Italy					+							
Ricci et al. (2020)	Construction Italy					+							
Rodríguez-Garzón et al. (2015)	Construction Spain			+									
Rodríguez-Garzón et al. (2016)	Construction Spain/Peru/Nicara-gua					+							
Roelofs et al. (2011)	Construction USA					+							
Salminen (2004)	Various sectors Dozen or so coun-tries	+				+							
Siu et al. (2003)	Construction Hong-Kong	+											
Trillo-Cabello et al. (2021)	Construction Spain	+	+	+	+				+				
Wang et al. (2019)	Mining China	+	+					+	+				
Wong et al. (2020)	Engineering stu-dents Hong Kong				+								
Yembi Renault et al. (2021)	Construction South Africa		+						+				
Zou and Zhang (2009)	Construction China/Australia					+							

Note: A-Age, B-Education, C-Training, D-Gender, E-Ethnicity and culture of employees/Nationality, F-Work type and role/Employee-supervisor, G-Nature of employment, H-Length of service/Experience, I-Marital status, J-Number of dependent family members, K-Drinking habit, L-Company size.

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There is no consensus among researchers in the area of risk perception assessment based on gender. For instance, Han et al. (2019) and Meng and Chan (2020) proved the existence of differences among male and female respondents, with women more likely than men to notice threats and their negative consequences. However, studies conducted by Chaswa et al. (2020), Ibrahim et al. (2022), and Trillo-Cabello et al. (2021) show that gender does not differentiate the perception of risk by employees. In the case of another demographic variable, i.e., age, Chaswa et al. (2020) and Han et al. (2019) demonstrated the impact of age on risk perception, with people aged 37-46 tending to ignore the risks associated with commonly encountered threats (Han et al., 2019). Wang et al. (2019) and Ibrahim et al. (2022) reached different conclusions, as according to their research results, all employees, regardless of their age, perceived the risk similarly. Inconclusive results were obtained by Meng and Chan (2020), as their research indicated that male employees' risk perception of workplace hazards increased with age, while among women, age had no significance in risk perception. Taking into account the length of service/experience of employees and their perception of threats in the workplace, the results of studies presented by the authors vary. Meng and Chan (2020) observed that the level of perception of threats to health and life increased with growing seniority among both male and female employees. Wang et al. (2019) and Chaswa et al. (2020) did not find a significant relationship between work experience and risk perception, while ambiguous results were obtained by Abbas et al. (2018).

In terms of the impact of training on risk perception among employees, Chaswa et al. (2020) and Ibrahim et al. (2022) did not find a significant relationship. Eiris et al. (2020) reached interesting conclusions, drawing attention not to the mere fact of undergoing occupational health and safety training by employees but to the quality of training and the training techniques used, which are, in their opinion, crucial. The level of education of employees and their perception of threats in the workplace is the subject of research conducted, among others (Chaswa et al., 2020; Han et al., 2019; Meng & Chan, 2020; Ibrahim et al., 2022). Chaswa et al. (2020) and Meng and Chan (2020) showed a positive correlation between education and risk perception, while according to Ibrahim et al. (2022), different levels of education do not influence the perception of workplace hazards. Similarly to the other correlations presented above, research results concerning the employee-supervisor characteristic and occupational risk perception vary among researchers. The study conducted by Abbas et al. (2018) indicates that the level of threat perception increases with a higher job position. However, Chaswa et al. (2020) and Ibrahim et al. (2022) proved that the level of the position held no significant relationship with the perception of threats and risks in the workplace.

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Empirical strategy

This section of the article attempts to build a model to describe the likelihood of workers in Europe perceiving work as a source of health or safety risk. Logistic regression, which is widely used in social research (e.g., Nieuwenhuijsen et al., 2010; Magnavita & Heponiemi, 2011; Meijman & Mulder, 1998), was used to accomplish this task.

Logistic regression methodology is described in detail in the literature, e.g., Maddala (1983), Long (1997), Szymczak (2010), Danieluk (2010), Gruszczyński (2012), Hosmer et al. (2013), Agresti (2013), and Wiktorowicz (2016). Here, we will only highlight the most important aspects and essence of logistic regression.

In logistic regression models, the output variable (Y) is a binary variable:

- Y = 0, the analysed event does not occur,
- Y = 1 the analysed event occurs.

The logistic regression model is based on a logistic function. This function is defined by the following formula:

$$f(z) = \frac{e^z}{1+e^z}, \tag{1}$$

$$z = \beta_0 + \sum_{i=1}^{k} \beta_i X_i. \tag{2}$$

The logistic regression equation allows the calculation of the conditional probability of success due to a specific factor and is expressed by the following equation:

$$P(Y = 1 \mid X_1, X_2, X_3 \ldots, X_k) = \frac{e^{\beta_0 + \sum_{i=1}^{k} \beta_i X_i}}{1+e^{\beta_0 + \sum_{i=1}^{k} \beta_i X_i}}, \tag{3}$$

where:

$P(Y = 1 X_1, X_2, X_3 \ldots, X_k)$ – conditional probability of the dependent variable obtaining the distinguished value (1) under the condition of obtaining specific values of the independent variables X1, X2, X3 …, Xk,

β0 – logistic regression constant,

βi – logistic regression coefficient for the i-th independent variable,

Xi – i-th independent variable.

To estimate β, the maximum likelihood method is used. The general idea of this method is to estimate the values of the unknown parameters in such a way that these maximise the probability of obtaining the observed values of the dependent variable (Hosmer et al., 2013).

The use of a logistic regression model makes it possible to determine both the strength and direction of the relationship between a qualitative (class type)

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or quantitative (discrete or continuous type) factor and a dichotomous explanatory variable. In addition to the dichotomous dependent variable, a prerequisite for using logistic regression is a sufficiently large sample size, which should be larger than 10 × (k + 1), where k is the number of independent variables (Stanisz, 2000).

In order to carry out inference about the effect of independent variables on the dependent variable, the odds ratio (OR) is used. It determines the change in the chance of the highlighted value of 1 dependent variable occurring when the independent variable increases by 1 unit. It assumes that the other independent variables in the model remain constant while the independent variable under study increases by a unit.

In order to verify the validity of the logistic regression model, a test called the reliability quotient test was conducted. With it, the combined significance of all variables in the model can be verified. For large numbers, the test statistic has a chi-square distribution with the number of degrees of freedom equal to the number of variables in the estimated model. Based on the estimates of the analysed model, it can be concluded that, in total, all variables in the model are significant (Table 4).

Data sources

The analyses in this article are based on primary data collected as part of the EWCS 2021 survey carried out on a sample of over 71,000 respondents from 36 European countries. The table presents the absolute and relative counts for the dependent variable and selected independent variables, divided into the three groups described in the article: Total, Eastern European Countries, Central European Economies. In all three sub-populations, the highest proportions of respondents were: those working in micro-enterprises (except in Central European Economies – here the highest percentage occurred for small enterprises), aged 45-55 (except in Eastern European Countries – here the highest percentage occurred for the 35-44 group), classified as professionals, working in other services, being employees, men, people with work experience of more than 10 years, and those with a university degree (Table 2).

Table 2. Distribution of variables in each subpopulation

	Eastern European Countries		Central European Economies		TOTAL	
	n	%	n	%	n	%
Company size	**16102**	**100.0**	**16041**	**100.0**	**69580**	**100.0**
1-9	5509	34.2	3807	23.7	22270	32.0
10-49	4826	30.0	4289	26.7	20597	29.6

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	Eastern European Countries		Central European Economies		TOTAL	
	n	%	n	%	n	%
50-249	3383	21.0	3963	24.7	15347	22.1
250+	2384	14.8	3982	24.8	11366	16.3
Age group	**16511**	**100.0**	**16535**	**100.0**	**71758**	**100.0**
16-24	1182	7.2	1474	8.9	5650	7.9
25-34	3966	24.0	3740	22.6	16414	22.9
35-44	4979	30.2	4050	24.5	19035	26.5
45-55	4299	26.0	4492	27.2	19131	26.7
56+	2085	12.6	2779	16.8	11528	16.1
Occupational group	**16511**	**100.0**	**16535**	**100.0**	**71758**	**100.0**
Armed forces	70	0.4	62	0.4	322	0.4
Managers	1804	10.9	1969	11.9	8883	12.4
Professionals	5233	31.7	4999	30.2	21859	30.5
Technicians and associate professionals	2620	15.9	2999	18.1	11320	15.8
Clerical support workers	1511	9.2	1819	11.0	6574	9.2
Service and sales workers	1923	11.6	1768	10.7	8929	12.4
Skilled agricultural, forestry and fishery workers	168	1.0	193	1.2	1014	1.4
Craft and related trades workers	1435	8.7	1183	7.2	5739	8.0
Plant and machine operators, and assemblers	972	5.9	678	4.1	3593	5.0
Elementary occupations	775	4.7	865	5.2	3525	4.9
Sector of activity	**16511**	**100.0**	**16535**	**100.0**	**71758**	**100.0**
Agriculture	317	1.9	214	1.3	1514	2.1
Commerce and hospitality	2744	16.6	2090	12.6	11110	15.5
Construction	914	5.5	984	6.0	4492	6.3
Education	1553	9.4	1547	9.4	7013	9.8
Financial services	944	5.7	1024	6.2	3966	5.5
Health	1309	7.9	2346	14.2	7681	10.7
Industry	3123	18.9	2524	15.3	11056	15.4
Other services	3676	22.3	3624	21.9	16182	22.6
Public administration	952	5.8	1289	7.8	4887	6.8
Transportation and storage	979	5.9	893	5.4	3857	5.4
Nature of employment	**16506**	**100.0**	**16527**	**100.0**	**71724**	**100.0**
(reported) self-employed with employees	689	4.2	619	3.7	3303	4.6

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	Eastern European Countries		Central European Economies		TOTAL	
	n	%	n	%	n	%
(reported) self-employed without employees	1460	8.8	992	6.0	5776	8.0
Employee	14357	87.0	14916	90.3	62645	87.3
Gender	**16511**	**100.0**	**16535**	**100.0**	**71758**	**100.0**
Man	8122	49.2	8811	53.3	37548	52.3
Woman	8389	50.8	7724	46.7	34210	47.7
Length of service	**16458**	**100.0**	**16506**	**100.0**	**71561**	**100.0**
Less than a year	2054	12.5	1860	11.3	8552	12.0
1 to 4 years	5456	33.2	4977	30.2	22750	31.8
5 to 9 years	3079	18.7	2780	16.8	12911	18.0
10 or more	5869	35.7	6889	41.7	27348	38.2
Education	**16477**	**100.0**	**16414**	**100.0**	**71393**	**100.0**
Primary education	34	0.2	209	1.3	885	1.2
Secondary education	7329	44.5	7307	44.5	30144	42.2
Tertiary education	9114	55.3	8898	54.2	40364	56.5
Do you think your health or safety is at risk because of your work?	**16397**	**100.0**	**16431**	**100.0**	**71299**	**100.0**
NO	11720	71.5	11506	70.0	49881	70.0
YES	4677	28.5	4925	30.0	21418	30.0

Source: authors' work based on Eurofound (2021).

Results of the analyses carried out

The presentation of the logistic regression models was preceded by a statistical analysis conducted using basic statistical tests used to compare populations, in particular the chi-square (or Fisher's) test of independence (Hosmer et al., 2013, Agresti, 2018).

In the sample population, those who perceive work as a source of health or safety risk accounted for 30% of the total respondents. The division into two sub-populations was based on the affirmative and negative answers given to the question: 'Do you think your health or safety is at risk because of your work?' All selected demographic and workplace characterisation factors statistically significantly differentiated the two subpopulations. The data presented in Table 3 show that the proportion of people perceiving work as a source of risk is the highest among those working in small businesses. Furthermore, between the

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ages of 16 and 55, the proportion of people for whom work is a source of health and safety risk increases in each subsequent age group analysed. In terms of occupational group, the highest proportion of people (above 40%) considering their work as a source of risk to health and safety was registered for Skilled agricultural, forestry and fishery workers (46.1%), Craft and related trades workers (41.7%), Plant and machine operators, and assemblers (43.5%). The sector of activity with the share of those who answered 'yes' to the question 'Do you think your health or safety is at risk because of your work?' is Health – nearly half of the respondents. A relatively high share was also recorded for Transportation and storage. The most overburdened with work are those who are self-employed and have employees at the same time. Every third respondent in this group indicated that the work they do is a threat to their health and safety. Women are less likely than men to say that work is a threat to their health or safety. The length of service influences how respondents perceive their work. With the length of service, the proportion of those who answered in the affirmative the question 'Do you think your health or safety is at risk because of your work?' increases in each successive group. Considering the education of the respondents, the highest percentage of people perceiving work as a source of risk was recorded for those with secondary education.

Table 3. Comparison of selected demographic and workplace characterisation factors between the groups of people who perceive work as a source of health and safety risks and those who do not

Variables		Do you think your health or safety is at risk because of your work?	
		YES	NO
Company size	1-9	27.70%	72.30%
	10-49	30.50%	69.50%
(p<0.001*)	50-249	28.90%	71.10%
	250+	25.50%	74.50%
Age group	16-24	22.80%	77.20%
	25-34	24.30%	75.70%
(p<0.001*)	35-44	29.20%	70.80%
	45-55	33.20%	66.80%
	56+	28.40%	71.60%
Occupational group	Armed forces	27.10%	72.90%
	Managers	21.70%	78.30%

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(p<0.001*)	Professionals	24.60%	75.40%
	Technicians and associate professionals	26.60%	73.40%
	Clerical support workers	18.00%	82.00%
	Service and sales workers	35.80%	64.20%
	Skilled agricultural, forestry and fishery workers	46.10%	53.90%
	Craft and related trades workers	41.70%	58.30%
	Plant and machine operators, and assemblers	43.50%	56.50%
	Elementary occupations	33.70%	66.30%
Sector of activity	Agriculture	34.40%	65.60%
	Commerce and hospitality	27.50%	72.50%
(p<0.001*)	Construction	32.10%	67.90%
	Education	30.10%	69.90%
	Financial services	16.30%	83.70%
	Health	49.50%	50.50%
	Industry	27.90%	72.10%
	Other services	19.90%	80.10%
	Public administration	30.50%	69.50%
	Transportation and storage	40.00%	60.00%
Nature of employment	(reported) self-employed with employees	33.00%	67.00%
	(reported) self-employed without employees	30.60%	69.40%
(***p***=0.004*)	Employee	28.10%	71.90%
Gender	Man	30.20%	69.80%
(***p***<0.001*)	Woman	26.90%	73.10%
Length of service	Less than a year	24.40%	75.60%
	1 to 4 years	26.50%	73.50%
(***p***<0.001*)	5 to 9 years	28.00%	72.00%
	10 or more	32.20%	67.80%
Education	Primary education	29.40%	70.60%
(***p***<0.001*)	Secondary education	33.50%	66.50%
	Tertiary education	24.60%	75.40%

p – probability in the chi-squared test of independence.
* – differences statistically significant (α = 0.05).

Source: authors' work based on Eurofound (2021).

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The basis for estimating the function of European workers' perceptions of their work as a source of health and safety risk was carried out using logistic regression (this method has been extensively discussed in Hosmer et al. (2013), among others). For this purpose, three logistic regression models were constructed and compared with each other: Model 1 (Total) based on the opinions of respondents from all European countries (37 countries, including all the EU Member States) that participated in the European Working Conditions Survey 2021 (N = 68629); Model 2 (Eastern European Countries) including respondents from the following countries: – Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia (N = 15919); Model 3 (Central European Economies) including respondents from the following countries: Austria, Belgium, France, Germany, the Netherlands, and Luxembourg (N = 15811).

The validation of the assessment of work performed was based on the question: 'Do you think your health or safety is at risk because of your work?' This is a binary variable, where 1 represents those who felt that the work they do poses a risk to their health or safety, while 0 represents those for whom the work is not a source of risk to health and safety. Demographic factors (age, gender, length of service, education) and factors characterising the respondents' workplace (company size, sector of activity – according to the NACE 2008 classification, occupation – according to the ISCO 2008 classification, nature of employment/labour market status) were proposed as exploratory variables.

Logistic regression models were considered valid if: (1) in a pooled test of model coefficients, the verified hypothesis H0: $\beta 1 = \beta 2 = ... = \beta k = 0$, H1: $\sim$ H0 (Szymczak, 2010; Menard, 2001), $p < \alpha$, (2) Nagerkelke›s pseudo R^2 is relatively high (Maddala, 1983), and (3) count R^2 is relatively high (Gruszczyński, 2012), in particular the percentage of correct qualifications for y = 1 is high (the model performs well in predicting the phenomenon under study when count R2 > 50%). Due to the inclusion of qualitative variables, the Hosmer-Leme show test was omitted. The Wald test (Hosmer et al., 2013) was used to assess the significance of the relationship for each of the independent variables. The odds ratio (OR, exp(B)) was used to assess how the likelihood of perceiving work as a source of health and safety risk differed in the study group compared to the reference group (Sweet & Grace-Martin, 2012). The study used a standard significance level of $\alpha = 0.05$; $\alpha = 0.1$ was used in a minority of cases. Calculations were carried out in PS IMAGO SPSS.

The results of the survey confirm that the perception of work as a source of health and safety risk depends on the gender, age, education and length of service of the respondent as well as on factors characterising the workplace, including the size of the company in which the respondent works, the sector of activity, occupational group and labour market status. There are differences between the country groups selected for analysis within the individual explanatory variables. In particular, these differences are evident in the probability of a phenomenon

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occurring in a given group of respondents compared to a reference group (ceteris paribus).

The logistic regression analysis conducted has confirmed that as seniority increases, the likelihood of perceiving work as a source of health and safety risks increases. This pattern is found in all three models: Total, Eastern European Countries, and Central European Economies.

- In summary, for all the three models (Table 4), it can be concluded that:
- Workers in small enterprises are more likely to perceive work as a source of health and safety risks than those working in micro-enterprises,
- Compared to elementary occupations, the probability of perceiving work as a source of danger is lower for Managers, Professionals, as well as Technicians and associate professionals; it is higher for Skilled agricultural, forestry and fishery workers, as well as Craft and related trades workers,
- The likelihood that work is considered a source of risk to health and safety is higher in the Health sector than in the Agriculture sector,
- No statistically significant differences were observed between the Construction and Agriculture sectors,
- Assessment of the impact of work on health and safety is similar among those with primary education and those with tertiary education.

Table 4. Determinants of perception of labour as a source of health and safety risks – a comparison of three logistic regression models

	Eastern European Countries – Model 2		Central European Economies – Model 3		Total – Model 1	
	OR	p	OR	p	OR	p
Company size[a]		**<0.001**		**0.030**		**<0.001**
10-49	1.220	<0.001	1.141	0.016	1.134	<0.001
50-249	1.179	0.003	1.034	0.565	1.126	<0.001
250+	1.074	0.263	1.134	0.035	1.042	0.163
Age group[b]		**<0.001**		**<0.001**		**<0.001**
25-34	1.234	0.014	1.096	0.222	1.278	<0.001
35-44	1.462	<0.001	1.127	0.123	1.316	<0.001
45-55	1.535	<0.001	1.008	0.917	1.241	<0.001
56+	1.145	0.165	0.802	0.011	0.984	0.714
Occupational group[c]		**<0.001**		**<0.001**		**<0.001**
Armed forces	0.505	0.028	1.910	0.022	0.580	<0.001
Managers	0.513	<0.001	0.650	<0.001	0.660	0.001

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	Eastern European Countries – Model 2		Central European Economies – Model 3		Total – Model 1	
	OR	p	OR	p	OR	p
Professionals	0.549	<0.001	0.628	<0.001	0.738	0.019
Technicians and associate professionals	0.602	<0.001	0.670	<0.001	0.560	<0.001
Clerical support workers	0.410	<0.001	0.507	<0.001	1.128	0.355
Service and sales workers	0.976	0.802	0.938	0.505	1.507	0.008
Skilled agricultural, forestry and fishery workers	1.661	0.019	1.609	0.018	1.627	<0.001
Craft and related trades workers	1.343	0.004	1.491	<0.001	1.623	<0.001
Plant and machine operators, and assemblers	1.198	0.104	1.322	0.018	1.285	0.062**
Sector of activity[d]		**<0.001**		**<0.001**		**<0.001**
Commerce and hospitality	1.176	0.333	0.808	0.261	0.797	0.003
Construction	1.101	0.588	0.867	0.470	0.965	0.654
Education	1.763	0.001	1.276	0.209	1.246	0.006
Financial services	0.855	0.396	0.697	0.071**	0.648	<0.001
Health	3.812	<0.001	1.808	0.002	2.219	<0.001
Industry	1.071	0.680	0.817	0.285	0.799	0.003
Other services	0.962	0.817	0.743	0.108	0.727	<0.001
Public administration	1.616	0.007	1.011	0.953	1.120	0.160
Transportation and storage	1.783	0.001	1.141	0.508	1.280	0.002
Nature of employment[e]		**<0.001**		**0.010**		**<0.001**
(reported) self-employed with employees	1.429	<0.001	1.261	0.017	0.910	0.058
(reported) self-employed without employees	1.241	0.002	0.884	0.162	0.764	<0.001
Gender[f]	0.873	0.001	1.086	0.039	0.940	0.001
Length of service[g]		**<0.001**		**<0.001**		**<0.001**
1 to 4 years	1.183	0.010	1.235	0.002	1.221	<0.001
5 to 9 years	1.240	0.003	1.458	<0.001	1.336	<0.001
10 or more	1.450	<0.001	1.598	<0.001	1.524	<0.001
Education[h]		**0.007**		**0.004**		**<0.001**
Primary education	1.028	0.945	0.983	0.920	0.957	0.555

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	Eastern European Countries – Model 2		Central European Economies – Model 3		Total – Model 1	
	OR	p	OR	p	OR	p
Secondary education	1.157	0.002	1.148	0.001	0.803	0.004
Constant	0.222	<0.001	0.344	<0.001	0.458	<0.001
p in the omnibus test of model coefficients	χ^2 (33) = 1107.81; p<0.001		χ^2 (33) = 764.57; p<0.001		χ^2 (33) = 4288.74; p<0.001	
Nagerkelke'sR^2	0.096		0.067		0.086	
% of the correct classifications for y = 1	55.9		57.4		58.5	
Count R^2	65.5		62.3		63.2	

** – differences statistically significant (α = 0.1), in the other cases – differences statistically significant (α = 0.05). Reference groups: a – enterprises with 1-9 employees; b – 16–24-year-olds; c – elementary occupations; d – agriculture; e – employee; f – man; g – Less than a year; h –Tertiary education.

Source: authors' work based on Eurofound (2021).

Compared to the reference groups, the probability of perceiving work as a source of health and safety risk is higher by the bracketed multiples in the models analysed within the following factors:

- Company size: Eastern European Countries – small enterprises (1.220) and medium enterprises (1.179), Central European Economies – small enterprises (1.141) and large enterprises (1.134), Total – small enterprises (1.134) and medium enterprises (1.126),
- Age group: Eastern European Countries – 25-34 years (1.234), 35-44 years (1.462), and 45-55 (1.535), Central European Economies – not applicable, Total – 25-34 years (1.278), 35-44 years (1.316), and 45-55 (1.241),
- Occupational group: Eastern European Countries – Skilled agricultural, forestry and fishery workers (1,661), Craft and related trades workers (1,343), Central European Economies – Armed forces (1,910), Skilled agricultural, forestry and fishery workers (1,609), Craft and related trades workers (1,491), Plant and machine operators, and assemblers (1,322), Total – Service and sales workers (1,507), Skilled agricultural, forestry and fishery workers (1,627), Craft and related trades workers (1,623), Plant and machine operators, and assemblers (1,285),
- Sector of activity: Eastern European Countries – Education (1,763), Health (3,812), Public administration (1,616), Transportation and storage (1,783), Central European Economies – Health (1,808), Total – Education (1,246), Health (2,219), Transportation and storage (1,280),
- Nature of employment: Eastern European Countries – self-employed with employees (1,429), self-employed without employees (1,241), Central Euro-

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pean Economies – self-employed with employees (1,261), Total – not applicable,
- Gender: Eastern European Countries – not applicable, Central European Economies – women (1,086), Total – not applicable,
- Length of service: Eastern European Countries – 1 to 4 years (1.183), 5 to 9 years (1.240), 10 or more years (1.450), Central European Economies – 1 to 4 years (1.235), 5 to 9 years (1.458), 10 or more years (1.598), Total – 1 to 4 years (1.221), 5 to 9 years (1.336), 10 or more years (1.524),
- Education: Eastern European Countries – secondary education (1,157), Central European Economies – secondary education (1,148), Total – not applicable.

Compared to the reference groups, the probability of perceiving work as a source of health and safety risk is lower in the models analysed within the following factors by the percentage given in brackets:
- Size of company: not applicable to any of the models,
- Age group: Total and Eastern European Countries – not applicable, Central European Economies – 56+ (↓ by 19.8%),
- Occupational group: Eastern European Countries – Armed forces (↓ by 49.5%), Managers (↓ by 48.7%), Professionals (↓ by 45.1%), Technicians and associate professionals (↓ by 39.8%), Clerical support workers (↓ by 59.0%), Central European Economies – Managers (↓ by 35%), Professionals (↓ by 37.2%), Technicians and associate professionals (↓ by 33.0%), Clerical support workers (↓ by 49.3%), Total – Armed forces (↓ by 42.0%), Managers (by 34.0%), Professionals (↓ by 26.2%), Technicians and associate professionals (↓ by 44.0%),
- Sector of activity: Eastern European Countries – not applicable, Central European Economies – Financial services (↓ by 30.3%), Total – Commerce and hospitality (↓ by 20.3%), Financial services (↓ by 35.2%), Industry (↓ by 20.1%), Other services (↓ by 27.3%),
- Nature of employment: Eastern European Countries and Central European Economies – not applicable, Total – self-employed with employees (↓ by 9.0%), self-employed without employees (↓ by 23.6%),
- Gender: Eastern European Countries – women (↓ by 12.7%), Central European Economies – not applicable, Total – women (↓ by 6%),
- Length of service: not applicable to any of the models,
- Education: Eastern European Countries and Central European Economies – not applicable, Total – secondary education (↓ by 19.7%).

Not described above, the remaining differences within the individual factors against the extracted reference groups proved to be statistically insignificant in the models analysed. Thus, it can be assumed, for example, that the respondents' opinions on work as a source of health and safety risks among those working in Construction are similar to those of the reference group – Agriculture (Table 4).

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Discussion

In most other studies, authors focus on isolating a narrow group of factors (3-4) that determine the perception of labour as a source of risk (Table 4) while our empirical study indicates that it is reasonable to consider a larger number of determinants/factors that differentiate attitudes towards the work environment as a source of risk to health and life. This broad approach to employees' perception of risk to health and life, applied to such a large sample of respondents, has allowed for an in-depth analysis of the phenomenon under study, taking into account demographic characteristics and factors characterising the respondents' workplace through the prism of multiculturalism.

As our research has shown, the demographic characteristics (age, gender, length of service, and education) of employees determine their perception of work as a source of health and safety risks. The order of the arguments presented in the discussion refers to the layout of Tables 2, 3, 4, which include the independent variables used in the construction of logistic regression models.

Age

Our research has shown that the age of employees is important in the perception of the work as a source of risks to their health and safety. Indirectly, therefore, our research has confirmed the findings made by many authors (Yembi Renault et al., 2021; Meng & Chan, 2020; Chaswa et al., 2020; Han et al., 2019; Abbas et al., 2018; Mučenski et al., 2015), who indicated a similar relationship, although it should be noted that the studies of the above-mentioned authors were narrowed to a group of construction workers. Our study has confirmed the results of the research carried out by Amponsah-Tawiah and Mensah (2016) on a group of drivers as well as the results of studies conducted by Wang et al. (2019) and Bahn (2013) on a group of miners.

The logistic regression models constructed indicate that employees in the 25-55 age group perceive health and life risks in the workplace more often than the youngest workforce (16-24). A statistically significant difference can be observed in the Total and Eastern European Countries models. Thus, we have confirmed the results of the study conducted by Chaswa et al. (2020) that employees' perceptions of workplace-related risks are observed less frequently among young workers, who inherently have an optimistic risk perception (Morgan et al., 2019). However, caution should be exercised in the inference, as there are studies (Ibrahim et al., 2022, Siu et al., 2003) which prove it that all employees, regardless of age, have similar levels of perception of health and life risks in the workplace.

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Gender

In the case of another explanatory variable, i.e., gender, unambiguous results were obtained regarding the significance of the effect of gender on the perception of risk in the workplace in all three models developed. Thus, the conclusions of other researchers have been confirmed (Meng & Chan, 2020; Han et al., 2019; Chaswa et al., 2020; Yembi Renault et al., 2021; Karimi & Taghaddos, 2019; Martinko et al., 2003; Naznin et al., 2016; Amponsah-Tawiah & Mensach, 2016). As there is evidence that there is no difference in workplace risk perception between men and women (Trillo-Cabello et al., 2021; Wong et al., 2020; Chaswa et al., 2020; Ibrahim et al., 2022), the findings of researchers in relation to the impact of gender on risk perception should be considered inconclusive and not fully recognised. However, our findings, due to the size of the sample the large variation in terms of demographic as well as workplace characteristics, can make a significant contribution to the claim that gender is an important determinant in the perception of the work as a source of risks to the health and safety of employees.

In addition, we have indicated that in the case of Eastern European Countries, women are less likely than men to perceive work as a source of risk to health and safety, similar to the European population as a whole – the Total model, which can be considered consistent with the results of the study conducted by Meng and Chan (2020) The opposite results were obtained only within the Central European Economies model, thus indirectly confirming the conclusions reached by Flynn et al. (1994) and Han et al. (2019), who conducted their research on a much smaller sample and within a selected economic sector.

Length of service

Another factor with a significant impact on the perception of work as a source of risks to the health and safety among employees of European companies was the length of service, which proved significant in all three logistic regression models. Many researchers have come to similar conclusions before (Meng & Chan, 2020; Crundal et al., 2012; Naznin et al., 2016; Bahn, 2013; Martinko et al., 2003), despite the fact that their studies were conducted on much smaller samples and were limited to selected industries and occupational groups (e.g., construction, mining or driver positions, construction workers, supervisory workers). A different conclusion, indicating that seniority is not significantly related to the perception of risk in the workplace, was reached by Chaswa et al. (2020).

The role of employees' seniority in workplace safety remains unclear, work experience gained through the length of service can both positively and negatively affect the perception of hazards in the work environment as well as the employee's awareness of how to avoid and minimise those risks (Hung, 2018; Javed et al., 2018). In our study, we have proven that with longer service, the likelihood of perceiving work as a source of health and safety risks increases. The

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above-presented conclusions apply to all three models: the Eastern European Countries, Central European Economies and Total.

Education

The level of education has proven to be another demographic characteristic that statistically significantly determines the perception of the workplace as a source of hazard to health and life. Our results are consistent with those of other authors (Ibrahim et al., 2022; Meng & Chan, 2020; Chaswa et al., 2020; Han et al., 2019; Karimi & Taghaddos, 2019). At the same time, conclusions made by other researchers (Yembi Renault et al., 2021; Han et al., 2019; Trillo-Cabello et al., 2021), whose statistical analysis showed that different levels of education have no effect on perceptions of health and life risks at the workplace cannot be confirmed.

The results of our analysis do not provide conclusive results for all the logistic regression models constructed. The analysis indicates that while there are statistically significant differences in the perception of health risks in the workplace, for the Eastern European Countries and Central European Economies models, the score for the secondary education level is higher than for the tertiary education level, which means that employees with secondary education perceive work as a source of hazard more often than those in the reference group, i.e., the ones with tertiary education. The opposite situation can be observed in the Total model, where respondents with secondary education had a lower score than those with tertiary education. This discrepancy is surprising, most likely due to the fact that in the Total model, i.e., a sample of 71,393 respondents, the respondents belonging to both the Eastern European Countries and Central European Economies groups accounted for less than half, i.e., 46% of the total number of respondents (Eastern European Countries – 16,477 individuals, Central European Economies – 16,414 individuals). The two subgroups accounted for a total of 46% of the study population, and the aggregate result for the Total model was determined by the remaining European countries.

In addition to the demographic factors described above, factors characterising the respondents' place of work (i.e., the size of the company, the sector of activity, the occupation and the nature of occupation/status in the labour market) were also analysed.

Company size

According to our findings, the size of the company significantly affects the perception of the workplace as a source of risk to the health and life of employees. Respondents representing micro companies (1-9 employees), the reference group in the modelling, are less likely than respondents from small companies (10-49 employees) to perceive the company as a place of risk to their health and life. This conclusion applies to all the logistic regression models analysed. Also,

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for Europe as a whole, there was a significantly higher likelihood of perceived risk in the work environment in medium-sized and large companies relative to micro companies. Our analyses are difficult to compare with studies carried out by other authors due to the fact that studies represented in the literature are usually limited to a selected industry, selected specific entities (case study) and a limited area or concern other aspects of workplace health and safety. Moreover, these studies are carried out on much smaller research samples. For example, Hung et al. (2011) limited their survey to small businesses in two states in the eastern United States, while Niciejewska and Kiriliuk (2020) made an assessment of the impact of workplace hazards on occupational safety in the opinion of employees of micro and small enterprises. According to Niciejewska and Kiriliuk (2020), employees of small enterprises (10-49 employees) compared to employees of micro-enterprises (1-9 employees) were more likely to indicate the importance of hazardous traumatic factors, especially biological factors, as a threat to life and health in the workplace. Our study confirms the findings of the above-mentioned authors.

Sector of activity

The surveyed employees represented ten industries of economic activity according to the NACE 2008 classification adopted for the study. Our research has confirmed that the sector of activity determines employees' perceptions of workplace hazards in all three logistic regression models. Of all the explanatory variables, the business sector has the greatest variation in the level of probability of risk perception relative to the reference sector, which was Agriculture. Health workers are several times more likely than employees in other industries to perceive their workplace as a source of health and life risks. This is more than 3.8 times for the Eastern European Countries group, 1.8 times for the Central European Countries group, and 2.2 times for the entire surveyed European population relative to the reference level – Agriculture. Undoubtedly, this result should be associated with the COVID-19 pandemic underway during the study, as healthcare was a sector of extremely high biological risks at the time.

Studies by other authors concerning risk perception in the workplace most often focus on the construction industry as one of the most hazardous and accident-prone sectors of the economy, as shown in Table 1. In our study, the construction industry was represented by 4,492 respondents, who accounted for 6.3% of the surveyed population, but for all three models, there was no statistically significant difference in the perception of health and life risks compared to the Agriculture sector. For other sectors of the economy, literature research is quite limited (Ajslev et al., 2017; Ahonen & Benavides, 2006; Wang et al., 2019; Niciejewska & Kiriliuk, 2020; Domínguez et al., 2021; Nelson & Zega, 2021) and does not address issues related to employees' perceptions of risk, so referring to our results is quite difficult.

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Occupational group

Respondents' occupation, according to the survey, is a variable that determines the perception of health and life risks in the workplace. While workers employed in positions such as Managers, Professionals, as well as Technicians and associate professionals in all three models are significantly less likely to view the workplace as a source of threats compared to employees in Elementary occupations, in the case of the Armed forces position, we identified significant discrepancies in the Central European Economies model relative to the Eastern European Countries model and to the entire Europe.

Representatives of the Armed forced occupational group of Eastern European Countries were nearly two times less likely to perceive a workplace hazard than employees of the 'Elementary occupation' reference group. The proportions are completely reversed in the Central European Economies, where Armed forced employees perceived such threats two times more often than employees of the 'Elementary occupation' reference group.

The discussion on the topic of occupation as a statistically significant determinant of perception of workplace hazards poses some difficulties since the classification of occupations used in our study (ISCO 2008) was not included in the studies of other researchers. The researchers performed comparative analyses usually in a group of employees in managerial positions in relation to subordinate front-line workers (Abbas et al., 2018; Hung et al., 2011; Borys, 2012; Meliá et al., 2008; Hallowell, 2010), and the overall conclusion was that the perception of risk among front-line workers is significantly lower than for those in managerial positions. One can also identify studies where the above-mentioned relationship was not found to be statistically significant (Ibrahim et al., 2022; Chan et al., 2017a).

Nature of occupation/Status in the labour market

The nature of the occupation/labour market status variable, like the factors described earlier, has turned out to be a statistically significant determinant of employees' perceptions of workplace hazards. Across Europe (Total model), employees (occupational group) as a reference group are less likely than employers to perceive hazards in their workplace, but the opposite is true for the countries of Eastern European Countries and Central European Economies. As with other factors, i.e., the occupational group and the sector of activity, other researchers have not actually conducted similar analyses.

Multiculturalism

The perception of risk in the workplace is multidimensional and shaped by many factors, of which cultural traditions take on particular importance, especially in times of globalisation, labour mobility and migration movements.

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The impact of cultural and ethnic variables considered in the context of workplace hazard perception has been studied by many authors (Rodríguez-Garzón et al., 2016; Chan et al., 2017a; Chan et al., 2017b; Ricci et al., 2020; Eiris et al., 2020; Zou & Zhang, 2009). The authors usually made a comparison between two groups of employees from different countries (Eiris et al., 2020; Zou & Zhang, 2009) or studied the phenomena in the context of minority ethnic groups against the background of the country's indigenous citizens (Chan et al., 2017a; Chan et al., 2017b; Ricci et al., 2020). Only the research results of Rodríguez-Garzón et al. (2016), who surveyed risk perception among 204 construction workers from Spain, 213 from Peru and 97 from Nicaragua, indicate that nationality did not matter in the perception of health and life risks in the workplace.

The breakdown into the Eastern European Countries (Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia) and the Central European Economies (Austria, Belgium, France, Germany, the Netherlands, and Luxembourg) used in this analysis is not the result of respondents belonging to a specific race (white – European, also known as Caucasian, yellow – Mongoloid, black – Negroid) but of the historical-geographical-geographical division functioning in Europe. Conducting a discussion against the findings of other authors due to the significantly different nature of the research may pose some interpretive problems.

Our research has shown that in both the Eastern European Countries and the Central European Economies models, the determinants of the perception of labour as a source of health and safety risks are the same demographic factors (age, gender, length of service, and education) and factors characterising the respondents' workplace (company size, sector of activity, occupation, nature of employment/labour market status). Given that the Eastern European Countries (Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia) are characterised by historical, cultural and economic differences distinguishing them from the countries of the Central European Economies (Austria, Belgium, France, Germany, the Netherlands, and Luxembourg), many significant differences were to be expected between these groups, as demonstrated with the independent variables in the logistic regression models presented earlier.

Conclusion

The issue of the perception of workplace as a source of hazards has been studied by researchers, but only in selected aspects (causes of accidents, safety climate, risk behaviour, functioning of OSH management systems) and within a limited scope (e.g.: construction sector, mining). Our multifaceted treatment of the problem, taking into account the eight factors from a cross-cultural perspective, provides new conclusions and can be an important voice in scientific discussion and social science.

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For the purpose of the analyses, data were obtained from the European Working Conditions Survey (EWCS) conducted by Eurofound in 2021 in 36 European countries, including the EU Member States, the UK, Norway, Switzerland, Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia. The statistical population consisted of more than 70,000 adult residents of the aforementioned countries. The survey was conducted using the CATI method. The main aim of the paper was to assess the impact of selected demographic factors (age, gender, length of service, and education) and factors characterising the respondents' workplace (company size, sector of activity – according to NACE 2008 classification, occupation – according to ISCO 2008 classification, the nature of occupation/status in the labour market) on the perception of adult European residents of the work they perform as a source of health and safety risks. The verification of the perception of hazards in the workplace was based on the question: 'Do you think your health or safety is at risk because of your work?' The use of logistic regression models in the study of workplace hazard perception can aid in the development of effective intervention strategies, accident prevention and improvement of overall worker health.

For the purpose of this article, three logistic regression models were constructed: the model for all European countries, the Eastern Europe Countries model (Bulgaria, Croatia, The Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia), and the Central European Economics model (Austria, Belgium, France, Germany, the Netherlands, and Luxembourg). This division was inspired by the historical-geographical and economic differences of the various countries.

Our analysis indicates that in all three models, the work environment as a source of risks to health and life is determined by demographic factors, i.e., age, gender, the length of service and education, as well as factors characterising the respondents' workplace, i.e. the size of the company, the occupation held, as well as the nature of occupation/labour market status. The survey shows that only 30% of respondents perceive risks in their workplace, which may indicate a low level of awareness among workers about the presence of health and life risks in the work environment. This proportion is preserved in all the three subpopulations: the Total, Eastern Europe Countries and Central European Economics.

The implications of our research can be considered in three dimensions: theoretical, practical and policy-related. A theoretical contribution to the development of the social sciences can be found in the proposed models developed using logistic regression concerning occupational health and safety, in particular, the perception of risk to health and life in the workplace. Positive verification of the models proves the validity of the criteria used. The developed models may be useful for the management interested in taking effective actions to improve the level of safety in the work environment. Taking into account demographic characteristics and factors characterising the workplace within the framework of practical implications should guide managers in planning preventive and improvement-oriented actions in the area of occupational health and safety, e.g.,

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occupational health and safety training, occupational risk assessment, observation of risky employee behaviour, etc. In the area of policy implications, the results of our research may constitute the basis for developing policies and programmes supporting European countries in striving to achieve a higher level of employee safety and health protection in the workplace.

The research is not without limitations, mainly due to the fact that the study was conducted during the COVID-19 pandemic period, which could have been a factor distorting the results. On the one hand, the COVID-19 pandemic became a source of additional risks in the workplace, thus may have led to an increased perception of risks. At the same time, the ability to work remotely during the pandemic may have resulted in an increased sense of security for many employees. However, our results, due to the very large scale of the research conducted, provide an opportunity for comparative analysis across a wide variety of cross-sections.

The research conducted should be treated as a starting point for further research into the analysed phenomenon. Based on the primary data collected in the EWCS 2021 survey, comparative analyses can be made between other groups in Europe, e.g., the Social-Democratic Countries (Denmark, Finland, and Sweden), the Baltic Countries (Estonia, Lithuania, and Latvia), the Mediterranean Countries (Cyprus, Greece, Italy, Malta, Portugal, and Spain), the Liberal Market Economies (Ireland, the United Kingdom), countries outside the EU, or between individual countries individually. The implementation of similar comparative analyses with other countries of the world, whose cultural diversity differs significantly from the countries of Europe, can be a starting point for the search for solutions, development and effective implementation of changes worldwide in order to achieve the goals of sustainable development.

The direction of further research should be to analyse the next edition of the EWCS survey and make a comparison with EWCS 2021 so that it will be possible to diagnose the strength of the impact of the COVID-19 pandemic on the sense of threat in the workplace. Indirectly, it will also be possible to assess the effectiveness of the implementation of the policies of individual European countries in pursuit of sustainable development goals. Our research also contribution to in-depth studies of employees' perceptions of specific hazards in the workplace, e.g., noise, vibrations (oscillations), contact with chemicals, contact with materials which can be infectious, work at height, microclimate, physical and mental workload and others, or factors related to the organisation of work, such as working time. Thus, there is room for in-depth or new analyses, which will be the subject of our further research.

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The contribution of the authors

Conceptualization, E.R.W., K.B. and K.N.; literature review, E.R.W., K.B. and K.N.; methodology, E.R.W.; formal analysis, E.R.W. and K.B.; writing, E.R.W., K.B. and K.N.; conclusions and discussion, E.R.W., K.B. and K.N.

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CZYNNIKI SPOŁECZNE I DEMOGRAFICZNE W KSZTAŁTOWANIU POSTRZEGANIA PRACY JAKO ŹRÓDŁA ZAGROŻEŃ DLA ZDROWIA I BEZPIECZEŃSTWA: BADANIE DOROSŁYCH EUROPEJCZYKÓW

STRESZCZENIE: Celem artykułu jest ocena wpływu wybranych czynników społecznych i demograficznych na postrzeganie przez dorosłych mieszkańców Europy swojej pracy jako źródła zagrożenia dla zdrowia i bezpieczeństwa. Badanie wpisuje się w koncepcję zrównoważonego rozwoju, podkreślającą ochronę praw pracowniczych i bezpieczne środowisko pracy. Zrównoważona praca definiowana jest jako taka, która nie szkodzi zdrowiu fizycznemu czy psychicznemu pracowników w dłuższym okresie. Wykorzystując dane z Europejskiego Badania Warunków Pracy z 2021 roku, obejmującego ponad 70 000 osób w 36 krajach, przeprowadzone metodą CATI z powodu pandemii, badanie zastosowało regresję logistyczną. Analizuje ono trzy modele: obejmujący wszystkie kraje europejskie oraz dwa skoncentrowane na Europie Wschodniej i Środkowej. Wyniki pokazują, że wielkość firmy, wiek, grupa zawodowa, sektor, charakter zatrudnienia, płeć, staż pracy i wykształcenie znacząco wpływają na postrzeganie ryzyka w miejscu pracy. Międzynarodowe porównania ujawniły różnice w tych czynnikach między grupami krajów, przyczyniając się do dyskusji naukowej w naukach społecznych.

SŁOWA KLUCZOWE: zrównoważony rozwój, bezpieczeństwo i higiena pracy, europejskie badanie warunków pracy, regresja logistyczna

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