Diversity Management in the Medical Device Industry in the Light of the Results of International Empirical Research

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ABSTRACT

Objective: The article aims to identify and evaluate the diversity management practices used in enterprises as well as the benefits and difficulties of diversity management.

Research Design & Methods: Empirical research was carried out in 2018–2020 using a diagnostic survey with a survey technique. The study surveyed 130 managers representing various medical device industry enterprises from four countries – Germany, Great Britain, France, and Poland.

Findings: The most frequently used diversity management practices were flexible working hours, integration activities for employees, and analysing employment structures and job satisfaction. The analysis results also confirm that the managers more often perceived the benefits of diversity management than the difficulties. At the same time, diversity management practices are implemented spontaneously in most companies.

Implications/Recommendations: The results of the research may be a source of practical recommendations for companies from the medical device industry *vis-à-vis* the broader use of diversity management. It may help them think about how to implement such practices and activities in their everyday routines. The research presented herein focused on three selected dimensions of diversity – age, gender, and multiculturalism. In the future, wider, cross-sectional research covering wider dimensions of diversity management in more countries would be worth doing.

Contribution: The presented research attempts to fill the gap in diversity management in the innovative and rapidly developing medical device industry.

Article type: original article.

Keywords: diversity management, medical device industry, diversity management practices, managerial competencies.

JEL Classification: M14, L65, F23.

1. Introduction

Modern organisations operate in conditions of constant change. This is largely conditioned by globalisation, the development of technology, employee mobility, shortened product life cycles, and often even of the enterprises themselves. When an organisation and the environment it operates in constantly change, intangible assets become crucial (Salopek, 2006; Bassett-Jones, 2023). Given the effects of globalisation and innovation, people and their potential become the organisation's most valuable capital, often constituting a source of competitive advantage (Liu, 2017; Minbaeva, 2017). At the same time, the teams operating within a given organisation are increasingly diverse. This is influenced by many factors, such as rapid internationalisation and globalisation, expansion and mergers, increasingly dispersement across different geographic locations, aging societies, and intensive demographic changes resulting in the functioning of one team of people representing several different generations of employees (Syed & Özbilgin, 2019).

Internationalisation and technological development have also ratcheted up demand for highly qualified employees. With the lack of specialists, those who may once have been on the labour market's periphery, including minorities, immigrants, and older people, are increasingly employed (Meschi, Taymaz & Vivarelli, 2016). In recent years, public awareness of human rights and equality in employment has grown, increasing the enforceability of anti-discrimination laws. In conclusion, diversity management (DM) grows out of economic changes, but its development is also strongly related to profound social changes (Inglehart, 1997). This area of management is therefore more and more often taken up in scientific research, which presents numerous approaches to solving the problems that attend it. In this article,

we examine diversity management from the point of view of human resources management.

Despite the advantages of diversity management, it has not been implemented uniformly in enterprises. For example, such management is rarely used in Poland, especially by small and medium-sized enterprises, and is somewhat limited to preventing discrimination. A lack of DM-related knowledge and competencies among management may be one reason for this (Kupczyk, Oleszkiewicz & Kubicka, 2014).

The present study focuses on managing the diversity of human resources in the medical devices industry. This area of the economy was selected for the range of its attributes: innovation is very high, it has great development potential, and is international. In fact, the medical devices industry is among the world's most innovative and rapidly growing industries (Gacek *et al*., 2013; Feliczek, 2016). The industry's international operations, specific market requirements, and the importance of scientific activities in developing new, high-technology products have led to high expectations being placed on enterprises and their managers (Chatterji, 2009). The opportunities arising from employee diversity management must be effectively used to meet these expectations in a rapidly transforming market. The literature on the subject shows extensive interest in the matter of managerial competencies, taking into account individual industries, including medical entities (Bloom *et al*., 2017; Ginter, Duncan & Swayne, 2018; Krówczyński, 2019; Hampel, 2021) and pharmaceutical companies (Qurashi & Zahoor, 2017; Ricardianto *et al*., 2022). However, little research has been done on the management staff of the medical devices industry in the context of diversity management. The research presented here is an attempt to fill this gap.

Empirical research was carried out using the diagnostic survey method with a survey in 2018–2020. 130 managers representing 130 medical device companies in four European countries – Germany, France, Great Britain, and Poland – participated in the research. Apart from Poland, the countries are highly active in the medical devices industry. Germany, France, and Great Britain are among the six countries with the highest number of registered medical device business entities, and the highest percentage of people employed in the industry in Europe.

The presented research aimed to identify and evaluate the diversity management practices used in the analysed enterprises and the benefits and difficulties of diversity management.

The article blends theory and empirical evidence. The first part presents an analysis of the literature on diversity management and a brief characterisation of the medical device industry. This is followed by a discussion of the empirical research methodology, including the purpose, research questions, and research tool. It also briefly characterises the group of respondents. The study on diversity management in the enterprises analysed is then presented. The article ends with a summary

and a brief discussion of the study's limitations and potential directions for further research.

2. Literature Review

Contemporary organisations operate in a rapidly changing environment. This compels them to introduce newer and newer solutions that enable the effective use of resources. Factors with the highest impact on organisations include internationalisation and international integration. These lead to the opening of new markets, the mass flow of work and products on a global scale, a further struggle for competitive advantage, demographic changes, the formation of multicultural and multi-ethnic societies, the flow of capital, rapid technical and technological progress, and natural disasters (Słocińska, Czarnecka & Przewoźna-Krzemińska, 2008). The influence of these factors is causing countries, economies, markets, and organisations to become less and less homogeneous and turn towards diversity.

DM grew out of demographic and socio-political changes in the United States in the last century and then spread to other parts of the world. It is more and more often addressed in the literature, with numerous factors influencing the need to implement DM being emphasised. According to research, three dimensions differentiate employees in the organisational reality: primary identity, secondary identity, and organisational identity (Walczak, 2011). Primary identity is the individual's internal dimension, including their psychophysical features, knowledge, abilities, predispositions, awareness, value system, norms and beliefs. It is shaped by their upbringing and external environmental factors. Secondary and organisational identity, on the other hand, refers to an individual's place in society, i.e., the roles and functions they perform in their private and professional life. Secondary identity includes place of residence, material status, marital status, education, and qualifications. Organisational identity depends on the organisation's culture and conditions, including the nature of the work performed, position, employee privileges, and responsibilities (Walczak, 2011).

The categorisations of identity and related diversity one finds in the literature are broad and sometimes obvious. Today, diversity concerns all aspects that differentiate people. These include not only externally visible features (such as gender, skin colour, language, and health status) but also invisible aspects such as learning style, values, and experience (Rakowska, 2021).

Multiple approaches to DM have been presented in the literature. One is the business approach, in which the diversity of employees is perceived as a strategic resource used to achieve economic benefits for the organisation. The legal and moral system approach, meanwhile, is limited to equal treatment of employees (Rakowska & Cichorzewska, 2016). Another view is the narrow and broad approach. In a narrow path, only one or two dimensions differentiating human resources are

considered, e.g., age and gender. However, in the broad approach may take several into consideration (Kopeć, 2014; Rakowska, 2018).

Researchers have put forward a number of definitions of DM (Gajek, 2014; Sabharwal, 2014; Rakowska, 2018, 2021), with most focusing on two aspects. The first is related to employees, their needs, potential, differences between them, and a friendly employment environment involving respect and fairness. The second aspect concerns the organisation's profit, development, competitive advantages, and the achievement of business goals. The emphasis on individual elements mainly differentiates the definitions of DM. Some authors consider issues related to employees and their needs to be superior, while others focus on profits for the organisation or process action. Diversity management is, therefore, not a straightforward concept. However, the research results presented in the literature indicate that diversity among employees is a vital organisational resource, one that can translate into business benefits.

Migration movements, which are currently very widely observed, especially in European countries, has helped societies become more diverse. EU policy indicates that diversity in culture brings undoubted benefits at the level of governments and organisations but poses new problems and challenges to those managing countries and organisations (Rakowska, 2021).

Researchers point to numerous benefits a well-thought-out and carefully implemented diversity management strategy can bring (Allen *et al*., 2008; Chavez & Weisinger, 2008; Skrzypek, 2018). The key benefits include increased competitiveness, opportunities to enter new markets, improved flexibility and adaptation on the part of the organisation, faster and more frequent perception of options in the environment, enhanced service for diverse customers, increased creativity and innovation, improved human capital through an increase in the diversity of skills and knowledge, access to talents, and shaping a positive working climate (Singal, 2014; Jelínková & Jiřincová, 2015; Kemper, Bader & Froese, 2016).

Detractors, on the other hand, enumerate the imperfections of DM, such as high costs, greater employee demands, the risk of marginalising some employees, the risk of disorganisation of activities or communication difficulties (Wziątek-Staśko, 2022). Multiple factors can cause a company to fail to implement diversity management, including a lack of competencies or knowledge of DM among management (Kupczyk, Oleszkiewicz & Kubicka, 2014). Other sources of failure extend to stereotypes, prejudice, lack of systemic, coherent actions, lack of trust in interpersonal relations in the organisation, and improper communication of activities (Walczak, 2011).

In this paper we look at diversity management in the medical devices industry, which, along with the pharmaceutical industry, "supports" the healthcare system. It features very high innovation, strong development potential, and an international

character. The effectiveness of achieving goals related to the protection of public health depends on the use of medical devices containing a wide range of products that enable the diagnosis and treatment of patients (Feliczek, 2016).

The medical device industry, which is often included in the medical industry or referred to as medical technology, includes companies that produce and sell medical devices. A medical device is one that meets the criteria of a medical device (for European countries, those criteria have been laid down in the Directives of the European Commission). The devices include instruments, apparati, devices, implants, in vitro reagents, calibrators, software, and the like, which the manufacturer has produced to use individually or in combination with other devices to diagnose, prevent, monitor, treat, or alleviate the symptoms of diseases. They can be well--known, everyday items like plasters, syringes, or latex gloves, but also more innovative solutions, such as diagnostic tests, wheelchair glasses, or more technologically advanced scanners, monitoring devices including ones created to do ultrasound, life support machines, implantation devices (MedTech Europe, 2015).

Currently, the medical device industry is most often described as heterogeneous and innovative. It is expected to further develop and increase in importance (Ramakrishna *et al*., 2015). Among the main factors determining its development are the progress in medicine, increase incidence of civilisation diseases, the aging of societies, and the occurrence of new diseases. These determinants and the growing wealth of organisations have led and will further lead to increased demand for healthcare services, which translates into increased healthcare costs (MedTech Europe, 2015). They can be reduced by improving patients' diagnoses, treatment, and rehabilitation by maintaining economic optimisation while using high technologies.

The medical device industry is growing at a pace similar to the arms and computer industries (Chatterji, 2009) – that is, among the fastest-growing in the world. This development extends to the increased sales of traditionally available products and the design and implementation of new, innovative products (Feliczek, 2016). The latter products mean the medical device industry is a high-tech one. It is developing particularly robustly in countries with highly industrialised, innovative economies and high national income *per capita* (Gacek *et al*., 2013). In addition to its production and commercial activities, the industry's innovativeness and technological advancement have given rise to highly developed research and scientific training. The industry's material products are often the culmination of years of scientific research and cooperation with the scientific and academic community. A solid scientific core requires the creation of highly specialised and well-paid jobs not only in the devices' sector but also cooperating sectors.

Despite the positive socio-economic impact, the medical devices industry is described as difficult to operate. High investment outlays, scientific activity, and a wide range of product users (public units, private organisations, and individual

clients) mean that many companies are unable to negotiate the market's tough conditions, and many ideas do not see the light of day or do not generate the expected return on investment. In addition, the extensive legal requirements governing the industry are an essential barrier to entry. The medical device industry is one of the most regulated industries. In addition, legislative differences from country to country can inhibit the free international trade of products (Eatock, Dixon & Young, 2009).

The medical device industry is one of the most innovative and dynamically growing in the world (Gacek *et al.*, 2013; Feliczek, 2016). Specific market requirements, the importance of scientific activities in developing new, high-technology products (Chatterji, 2009; Lee-Makiyama, 2016), and the international nature of operations all combine to mean a great deal is expected of both enterprises in the industry and their management teams. The opportunities arising from employee DM must be effectively used to meet these expectations in a rapidly transforming market. The literature analysis on the subject showed extensive interest in managerial competencies across industries. Work done on medical care looked at the role of managers of medical entities (Bloom *et al.*, 2017; Ginter, Duncan & Swayne, 2018; Krówczyński, 2019; Hampel, 2021) and pharmaceutical companies (Qurashi & Zahoor, 2017; Ricardianto *et al.*, 2022). However, there is a paucity of research on management in the medical device industry and analyses that look at DM. The present research will contribute to filling this gap.

3. Research Methodology

In this article we have used the quantitative approach. The research set out to identify and evaluate DM practices used in enterprises as well as the benefits and difficulties of diversity management. It sought to find answers to the following research questions:

RQ1. Do the companies in the study have a diversity management strategy?

RQ2. What are the differentiating dimensions of employee diversity?

RQ3. What diversity management practices are used in companies in the medical device industry?

RQ4. What benefits and problems related to diversity management do the respondents identify?

After analysing the literature on the subject and reports and materials provided by organisations related to the medical devices industry, research questions were formulated, and a questionnaire was designed.

The research presented here is part of a broader research project on the competencies of managers in the medical device industry and diversity management in the companies they represent. The research questionnaire was self-developed. However,

the questions were developed in the light of the literature review and verified during pilot studies (individual interviews with managers in the industry).

The part of the questionnaire devoted to managing diversity contained eight questions. Respondents expressed their opinions on diversity management using a 5-point scale, where 1 was the lowest value, and 5 – the highest. The questions concerned the applied diversity management practices, benefits, and possible problems related to implementing DM in the respondent's company. Quantitative research was conducted in English, in direct contact. Managers who were Polish were shown a Polish language version of the survey. The questionnaire was translated from Polish into English and backward into Polish to ensure conceptual equivalence and transparency.

Empirical research was conducted among managers of medical device companies in 2018–2020 using the diagnostic survey method with a survey technique. The selection of the research sample was purposeful. Approximately 26,000 medical device companies are estimated to be operating in Europe (MedTech Europe, 2016). The study covered 130 managers, or about 0.5% of the population. These were mainly high- and middle-level managers, primarily at small and medium-sized enterprises (around 95% of entities in the sector are small and medium-sized). It is assumed that the design of the surveyed sample in terms of gender, age, and nationality reflected the sector's structure.

The research was conducted in Germany, France, Great Britain, and Poland. Apart from Poland, countries with a well-developed medical device industry were selected for the study. Germany, France, and Great Britain are among the six countries with the highest number of medical device business entities and also have the highest percentage of people employed in the industry in Europe. It is estimated that in 2017, the European medical device market reached a value of EUR 115 billion, constituting 27% of the global market share and placing Europe a distant second to the USA (43%). The countries that contributed most to achieving this result were Germany (27.4%), France (15.0%), and Great Britain (11.0%).

The survey was conducted among 130 managers from 130 different organisations. 21% of the managers work in micro-enterprises, 46% in small enterprises, 25% in medium enterprises, and 8% in large enterprises. At the same time, 71% of these enterprises operate in the global arena, 18% in the European arena, and 11% on a national level. 32% of the managers' organisations are registered in Germany, 19% in Great Britain, 26% in France, 18% in Poland, and 5% in other countries.

Among the managers, 11% are at a low management level, 67% at a medium or high level, 18% work under a managerial contract, and 5% did not answer. The study involved 38 women and 91 men (one person did not answer the question regarding gender). Among them, 19% represent the Baby Boomers Generation, 43% Generation X, and 38% Generation Y.

The research provided empirical material that was subjected to statistical analysis. The data obtained were entered into a database established in an Excel spreadsheet. Relationships between the qualitative variables were assessed using the chi-square test of independence. The analyses were performed at a significance level of α = 0.05. Respondents expressed their opinions on diversity management using a 5-point scale, where 1 was the lowest value, and 5 – the highest. For comparative analyses, items for which respondents chose answers at level 4 or 5 were considered.

4. Results and Discussion

The questionnaire began with a question about applying a diversity management strategy in the manager's company. Analysis of the results – the opinions of managers, that is – showed that 54% of enterprises manage the diversity of human resources, while 34% do not. 10% of the managers could not give a clear "yes" or "no" answer.

The question of how diversity management is implemented in enterprises across the individual countries yielded interesting results. Only "yes" responses were analysed. The respondents' statements show that the percentage of positive answers is similar. The highest rate was obtained for Great Britain (60%) and France (58.8%). Slightly lower rates were obtained in Poland (47.8%) and Germany (47.6%).

While managers at more than half of the companies indicated their company had a DM strategy, only a third could refer to an actual document on the strategy. When asked about a formal document, as many as 69% of respondents answered "no" or "I do not know". A detailed data analysis using the chi-square test of independence showed no statistically significant relationships between managers' statements representing individual countries (chi-square = 5, *p*-value = 4.93, significance level α = 0.05). However, certain tendencies of positive comments can be identified. The respondents' statements show that a formal diversity management strategy exists in 28% of the British and 24% of the French companies. Here too, companies from Germany and Poland indicated the existence of formal documents less frequently (12% and 9%, respectively).

The next question concerned implementing the equal opportunities policy in the companies. Most respondents (76%) stated that their company had such a policy, while 12% said their company did not. The other 12% said they did not know.

Figure 1 presents the differentiating dimensions based on which diversity is managed in the companies analysed. In the opinion of the respondents, among enterprises in which diversity is controlled, the most common differentiating dimensions are age (42.8%), gender (37.4%), and nationality (29%). The companies under analysis also consider employee differences in terms of religion and disabilities.
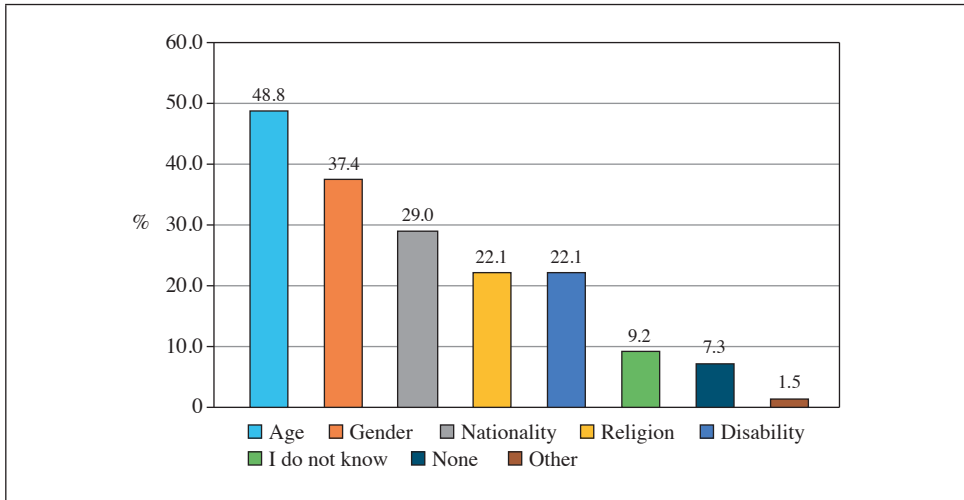
Fig. 1. Differentiating Dimensions Used to Manage Diversity in the Enterprises
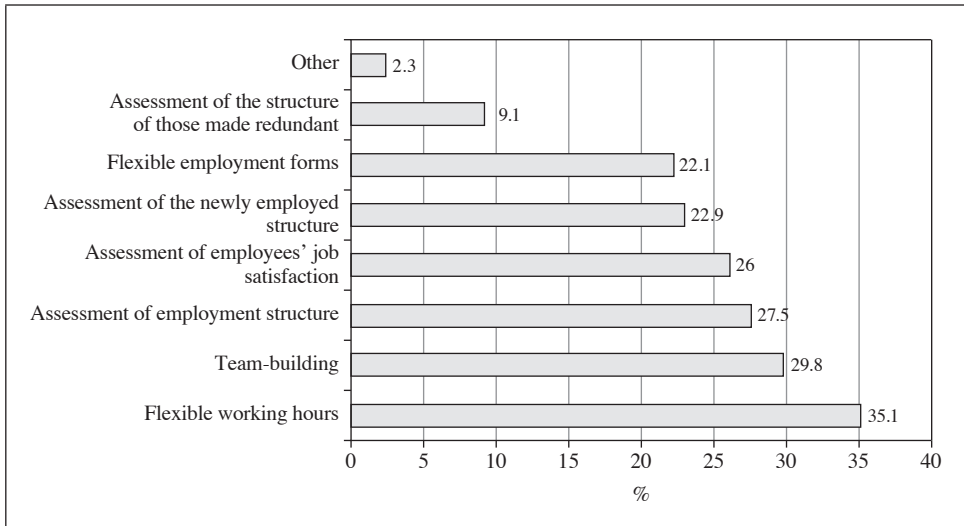Source: the authors, based on their research results.

Fig. 2. Practices Used as Part of Diversity Management According to the Managers Surveyed
Source: the authors, based on their research results.

When asked about DM practices at their companies (Fig. 2), the respondents indicated the following were the most often used: flexible working time (35.1%), integration activities for employees (29.8%), research into the structure of employment (27,5%), employee satisfaction with work and new hires (26%), taking into

account the differentiating dimensions practiced in the company (23%). Flexible forms of employment were then introduced and the structure of those made redundant was analysed.

The perception of the need for diversity management in the enterprises was another exciting aspect of research. More than half of the respondents (55%) stated they see such a need in their company. Almost a third (29%) do not see such a need, while 16% have no opinion on the subject.

The respondents were also asked to indicate the benefits of diversity management (Fig. 3). These include a good atmosphere (average rating of 4.3), broader thinking thanks to different points of view (4.2), and a positive image of the organisation (4.2). Rounding out the list were: increasing the involvement and motivation of employees (4.1), expanding knowledge, enriching experiences, and developing employees' competencies (4.1), strengthening the value of culture within the organisation (4.1), and improving the capacity for problem-solving (4.0). Other benefits were rated lower.
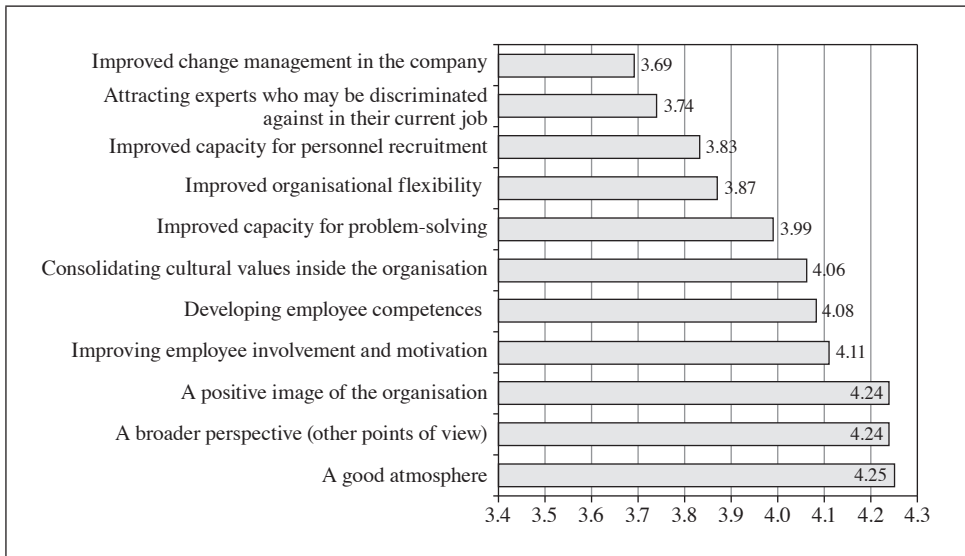

Fig. 3. Perceived Benefits of Diversity Management, Respondents' Opinions (Average Grade on a 5-Point Scale)

Source: the authors, based on their research results.

Our comparative analysis of the benefits observed by managers representing different countries yielded interesting results. The items for which the respondents chose an affirmative answer were taken into account (i.e., they rated them as 4, "I rather agree", or 5, "I strongly agree", on a 5-point scale) (Fig. 4).
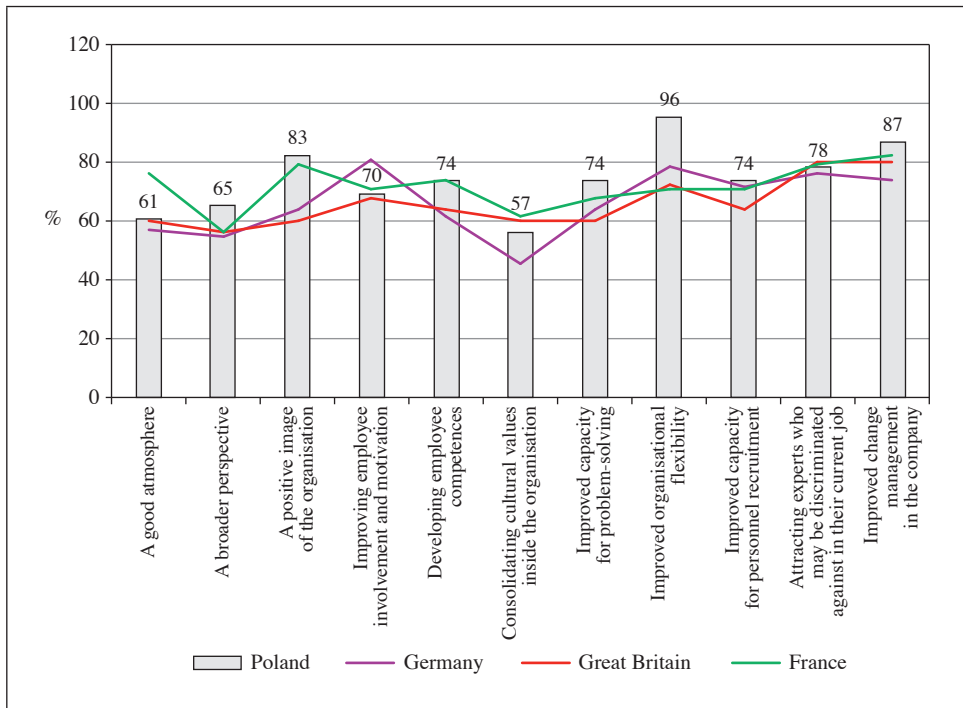
Fig. 4. Perceived Benefits of Diversity Management by Country – the Structure of Positive Ratings (4 + 5 on a 5-Point Scale; %)

Source: the authors, based on their research results.

Managers representing Polish enterprises rated the benefits of increasing organisational flexibility, change management, building a positive image of the organisation, and broader thinking (using a different perspective) more than other respondents. However, the statistical analysis of the respondents' statements showed no significant differences between countries.

Respondents were also asked to assess the problems arising from diversity management (Fig. 5). For this purpose, they were asked to indicate to what extent they agree or disagree with the following sentence: "The implementation of diversity management causes problems such as: (…)". The results presented in Figure 5 show that the managers surveyed did not confirm the occurrence of a problem. Regarding the "requirement of higher competences of managers and HR specialists", they had doubts. The average rating for this item was 3.8 (a rating of 3 meant "neither disagree nor agree"). The managers rejected the remaining three suggestions for problems. The average rating of 2 was "I rather disagree". It can therefore
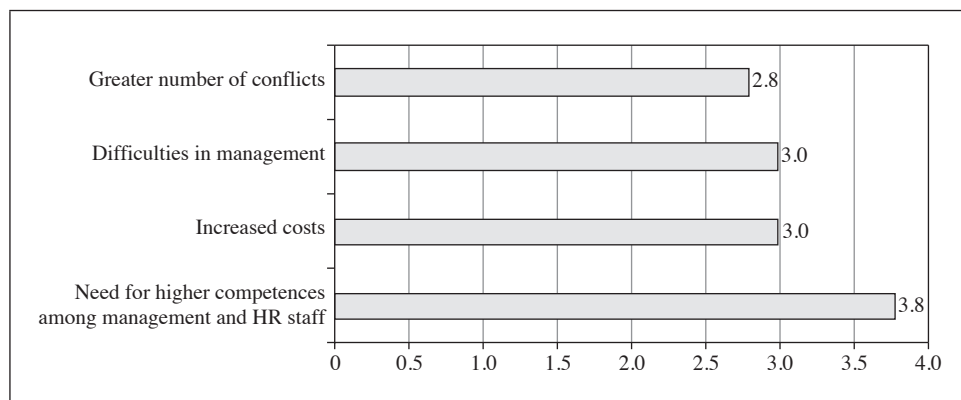
Fig. 5. The Problems Arising from Diversity Management in the Opinion of Respondents (Average Grade on a 5-Point Scale)

Source: the authors, based on their research results.

be concluded that the surveyed managers disagree that diversity management entails increased costs (3.0), hindered management (3.0), or creates more conflict situations (2.8).

5. Conclusions

The results of our research show that the diversity of human resources is managed in 54% of the medical device companies we surveyed. In terms of the individual countries, the companies in Great Britain (60%) and France (58.8%) had the highest rates, while Poland (47.8%) and Germany (47.6%) had somewhat lower rates. Nearly a third of the organisations had a formal document detailing their DM strategy. A legal diversity management strategy existed in 28% of the British companies and 24% of French ones. Companies from Germany and Poland indicated the existence of formal documents significantly less frequently (12% and 9%, respectively). Although the statistical analysis of the collected material did not show significant dependencies, some trends can be observed here. For example, companies in Poland and Germany still have a lot to do to implement employee diversity management policy. It is worth noting that the difference between the number of enterprises in which diversity is managed (according to the respondents' declarations) and those in which there is a formal document regarding this area may indicate that managers are not informed about such a document or that the approach to diversity management is "spontaneous". At 69%, the high rate of "no" and "I do not know" responses to the question about the diversity management strategy may suggest the issue is not a point of focus in the enterprises.

Age, gender, and nationality were the most common dimensions for which diversity management is applied. This is consistent with our findings in the literature. The most commonly used HR practices included flexible working time, employee integration activities, research into the structure of employment, employee satisfaction with work and new hires, and consideration of the differentiating dimensions practiced in the company.

The managers we surveyed saw the benefits of HR more than the potential problems. The highest-rated benefits include a good atmosphere, a broader perspective of thinking thanks to other points of view, and a positive image of the organisation through involvement in managing the diversity of human resources. Statistical analysis of the collected material did not show any significant differences in the statements of managers representing different countries. However, some trends can also be observed here too. Managers representing Polish enterprises rated more highly the benefits related to the increase in organisational flexibility, change management, building a positive image of the organisation, and using a broader perspective of thinking.

The literature analysis showed a research gap in the implementation status and the scope of diversity management in medical device organisations. Our aim with this research was to begin to fill this gap. The research area was limited to four countries, and the focus on three fixed dimensions of diversity only allows for generalising the results to some of the population. However, the research results indicate specific trends in diversity management in medical device companies. The results presented here may be the basis for broader research in the future.

Authors' Contribution

Conflict of Interest

The authors declare no conflict of interest.

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