

THE IMPACT OF THE COVID-19 PANDEMIC ON MANAGING THE WORK SAFETY CULTURE IN THE CONSTRUCTION INDUSTRY COMPANIES IN POLAND

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Aneta Celoch¹ – *orcid id: 0000-0002-3101-8698*

Klaudia Smoląg¹ – *orcid id: 0000-0001-8875-9836*

¹Czestochowa University of Technology, **Poland**

Abstract: The COVID-19 pandemic has had a significant impact on personal and professional lives of people around the whole world. Numerous enterprises were forced to limit their activities. However, the employees of certain industries, performing work necessary for the normal functioning of the society, have been constantly exposed to epidemiological threats. The construction industry is an example of this. The ongoing threat of the pandemic could have had a significant impact on the workers' behaviour and perceptions of safety. The work safety culture could have undergone such a change. The main purpose of the article was to determine whether the pandemic influenced the work safety culture in the construction industry. The methodological tool applied was a questionnaire addressed to people who directly supervised work on construction sites. The survey was conducted among 49 Polish enterprises operating in the Silesian Province. The results of the research indicate that the COVID-19 pandemic has caused changes in the work safety culture, most of which were positive. An analysis of the literature on the impact of the COVID-19 pandemic on the safety of workers indicates that publications in this area are primarily aimed at representatives of healthcare, while there are few publications on changes in the area of health and safety in the construction industry. This paper is an attempt to fill this research gap.

Keywords: work safety culture, COVID-19 pandemic, occupational health and safety management

1. INTRODUCTION

The COVID-19 pandemic has forced many changes upon the daily lives of people around the world. The epidemiological threat that has arisen affects not only one's health, but safety as well. The impact of the pandemic is experienced in both, one's personal and professional life. In the workplace, the changes were mainly due to the obligation to provide additional protection measures, maintaining distance, but also from destabilizing the professional situation. The threat of the pandemic, which has been continuing since the beginning of 2020, could have significantly influenced the behaviour of employees and their perception of safety. Thus, the work safety culture,

an essential part of every organisation understood as values, attitudes, perceptions, behaviour patterns, and competences of one or a group of people with regard to work safety, could undergo changes. During the pandemic, employees in professions that are associated with constant contact with new people, i.e., service and commercial enterprises, have been particularly vulnerable. Many employees could not switch to remote work due to the specificity of their profession, especially in service-related activities. At this point, it is worth focusing on the construction industry, which includes many activities necessary for the normal functioning of the society. Regardless of the pandemic, some repairs or other construction activities have to be performed, as they hinder or even prevent normal everyday functioning. It should be remembered that the construction industry is also of great importance for the economy of almost every country. In Poland, its share in GDP (gross domestic product) in 2019 amounted to 6.6%, with the gross added value estimated at the level of PLN (Polish zloty) 145.5 billion (Budownictwo...).

The aim of the study was to analyze the impact of the COVID-19 pandemic on the culture of work safety in construction service companies in the Silesian Voivodeship in Poland. As part of the implementation of such an objective, a pilot study was carried out among 49 companies from the construction sector in Poland located in the Silesian Province. The group of respondents included business owners, management staff, and OHS specialists in small and medium-sized enterprises because, as research shows, it is mainly these enterprises that ensure the development of the economy and economic security. Therefore, the priority is to maintain employment in these enterprises (Ciekanowski and Wyrębek, 2012). This study was the basis for the attempted answer to the following research question: What is the impact of the COVID-19 pandemic on the safety culture of the construction industry? This study is a contribution to the literature on work safety culture management.

1.1. Work Safety Culture

Work safety culture (WSC) is a part of a company's organisational culture, and is an important aspect of the functioning of any organisation. It should be emphasized that, regardless of the fact that it is always developing, this culture has existed in the organisation from the very beginning, although it has different levels (Hopkins, 2006). The definition that is most often used to describe safety culture was developed by the Health and Safety Executive and reads as follows: "the result of individual and group values, attitudes, perceptions, competences, and patterns of behaviour, as well as the style and quality of safety management in enterprises" (Guldenmund, 2010). The importance of work safety culture results from the need for resources that affect social and organisational factors, as the main cause of accidents at work is an employee's incorrect behaviour (Wypadki..., 2019). Building and raising the level of work safety culture is important not only in the context of reducing accident rates (although it is a priority), but also contributes, among other things, to reducing employee absenteeism, lack of downtime in the implementation of enterprise processes, and reducing costs for the organization (Kowal et al., 2019). Geller emphasises that effectively building a work safety culture involves introducing changes in three areas (Geller, 199):

- physical environment,
- internal characteristics of the employee,
- employees' behaviour.

It will not be possible to achieve the intended objectives if any of these areas does not function properly. The physical environment, i.e., the condition of machines, tools, organisation of the workplace, etc., should be in accordance with OHS requirements. In enterprises with a high work safety culture, the work environment is at a higher level than recommended, new technical solutions are constantly being sought out, and great attention is paid to work ergonomics (Mannan et al., 2013).

An internal characteristics of the employee involve their qualifications, knowledge, abilities, or motivation to perform work. If these features are not developed to a sufficiently high level, the work will not be performed properly. An employee who does not have the appropriate knowledge, or is unable to practically use the security provided to them, is not able to effectively protect their own health and life, and thus becomes a threat to themselves and their colleagues. Organisations characterised by a high work safety culture constantly train and motivate employees in the area of work safety (Piątek 2018).

On the other hand, employee behaviour is related to communication skills, respecting health and safety rules, and caring for their health and life and that of other employees. Enterprises wishing to improve the results of this area often decide to introduce behavioural methods to the process of shaping the safety culture, which are predestined to model the behaviour of employees (French, Geller, 2008).

An important element of introducing changes in the work safety culture is their implementation as a process, not a program. Only a process-based approach toward changes may result in the actual adoption of new values by employees and, consequently, bring a long-lasting effect in the form of a lower accident rate (Mannan et al., 2013). Additionally, it should be noted that changes in the area of safety culture take time to “take root” and bring noticeable results. In connection with the above, it should be clearly emphasised here that WSC will not change quickly due to the factors that influence it. (Antonsen, 2009).

1.2 Construction Industry in Poland

Constructing various types of objects is characterised by complexity due to the variability of the work performed over time. Enterprises with different specificities appear on the construction site, depending on the stage of the building's construction process. (Kerzner, 2009). The construction industry covers a variety of services, such as: erection of buildings, construction of roads and rails, pipelines, telecommunications and power lines, electrical installations, plumbing, demolition and preparation of construction sites, construction and roofing, and finishing construction works (Załącznik..). Each of the above-mentioned activities is associated with a high risk, caused by the dynamics of construction projects (Bobick, 2004). The following factors influence the risk in the construction industry: weather conditions, rotation among construction team employees and the employment of seasonal, unskilled workers (Rozenfeld et al., 2010). In addition, studies show that changes in previously established design are correlated with incidence and accident tendency (Wanberg et al., 2013). During construction workers are exposed to physical hazards (falling from a height, being hit or crushed, slipping or falling on the same level, falling objects), chemical (chemical compounds in materials used) and biological (micro and macroorganisms) (Aneziris et al., 2012). Moreover, due to the complicated working conditions, behaviour of workers on the construction site is not standard, as in the case of production workers (Fang and Wu, 2013).

According to preliminary data for 2020 prepared by the Central Statistical Office (GUS), the accident rate in Poland was 4.62 per thousand people, while in the case of the Silesian Province, it was 5.24 per thousand people. The number of accidents in the construction industry in Poland has been decreasing over the last few years: it is worth noting that, in 2020, there was a decrease in the number of accidents in comparison with 2019 by 24.6%, while the decrease in 2019 in comparison with 2018 was 1.3% (Wypadki..., 2019; Wypadki..., 2018; Wypadki..., 2020). A considerable drop in accident rates in Poland could be caused by the suspension of many activities due to the pandemic, or a reduction in employment. Detailed data on the accident rate have been presented in Table 1 below.

Table 1
Statistical data on accident rates in Poland

	2018	2019	2020
Injured employees in accidents at work per 1000 employees in Poland	6.37	6.06	4.62
Injured employees in accidents at work per 1000 employees in Poland—construction industry	6.02	4.83	4.28
Number of severe accidents at work in Poland	517	396	371
Number of severe accidents at work in the construction industry in Poland	84 (16,2% *)	41 (10.4% *)	57 (15.4% *)
Number of fatal accidents at work in Poland	209	184	189
Number of fatal accidents at work in the construction industry in Poland	48 (22% **)	44 (23.9% **)	39 (20.6% **)
Number of accidents at work with a different effect in Poland	83578	82625	62180
Number of accidents at work with a different effect in the construction industry in Poland	5114 (6.1% ***)	4658 (5% ***)	3776 (6.1% ***)
Injured employees in accidents at work per 1000 employees in Silesia	7.24	7.26	5.24
Most common cause of an accident at work in Poland	Inappropriate employee behaviour	Inappropriate employee behaviour	Inappropriate employee behaviour

* percentage of serious accidents in the construction industry among all serious accidents, ** percentage of fatal accidents in the construction industry among all fatal accidents, *** percentage of accidents with a different effect in the construction industry among all accidents with a different effect.

Source: Own study based on: (Wypadki..., 2019; Wypadki..., 2018; Wypadki..., 2020).

Despite declining accident rates in the industry, the risk to health and life remains high. The emergence of additional threats may cause a change in the level of safety on construction sites, especially such a radical threat as the COVID-19 pandemic. The outbreak of the pandemic resulted in the introduction of various restrictions in Poland in order to minimize the effects of the pandemic which severely affected entrepreneurs, some of which were forced to cut jobs, others to close down their businesses. A particularly difficult situation has arisen in the hotel and catering industry (Grondys et al. 2021). The construction industry has not faced the forced closure of its activities, but due to its service nature, it was exposed to significant epidemiological

threats. The first restrictions on construction sites were introduced on 2 April 2020 and included (Rozporządzenie..., 2020):

- the obligation to cover the nose and mouth;
- the obligation to maintain the distance of 1.5 m;
- the obligation to provide employees with disposable gloves and disinfectant liquid;
- maximum 50% occupancy in means of transport (over 9 seats) for employees,
- recommendations for rotary use, and in smaller groups of people, of locker rooms and social rooms,
- allowing construction workers on business trips to stay in hotels.

For projects that could not be performed while maintaining 1.5 meters between employees, the distance could be reduced. Over time, after the end of the third wave of the pandemic and a significant drop in the number of cases in the second quarter of 2021, the restrictions applicable at the construction site were as follows (Rozporządzenie..., 2021):

- the obligation to cover the nose and mouth, unless the employer decides otherwise;
- 75% occupancy of seats in collective means of transport (over 9 seats);
- opening hotels to the public with a maximum occupancy of 50%;
- the employer's obligation to ensure security measures.

In addition to the indicated restrictions, during the pandemic, the construction industry has also been struggling with downtime at work.

Given the theoretical framework, the aim of the research was to determine whether the pandemic affected WSC in the construction industry. The presented studies indicate that the restrictions introduced during the COVID-19 pandemic may have had an impact on the work safety culture. The presented considerations show that the COVID-19 pandemic had a positive impact on all areas of the safety culture, i.e., the physical environment, employee behaviour and internal characteristics of employees. "Concern for one's own safety and that of co-workers" area has improved the most. Despite the general improvement of the situation, a negative direction of impact was noted in some elements, such as: number of near-misses, breaking OHS rules, increased number of overtime hours or adaptation of the workplace in compliance with the requirements. The results could be influenced by factors such as: stress, fatigue, fear of the situation that arose. For each enterprise, it is extremely important to identify these elements in order to ensure safety and create a good working atmosphere, which is certainly conducive to the development of the organization.

2. Methodology

A survey questionnaire was employed to achieve this aim, which was addressed to supervisors of works in construction companies. The research sample was randomized in a group of companies active on industry job offer portals. To achieve the set goal, an original questionnaire was used, which was addressed to people supervising work in companies in the construction industry. The sampling frame was a list of companies active on industry offer portals. From this group, a randomly selected group of 900 enterprises (using the pseudo-random number generator included in Excel) was selected. In the course of data verification, access to 853 e-mail addresses was obtained the remaining ones did not have an address, suspended or terminated their activity. 853 companies from the construction industry of the SME sector located in the Silesian Province in Poland were invited to participate in the survey. In return, the

authors obtained 137 completed questionnaires, and the sample ultimately involved 49 companies that submitted complete questionnaires, whose participation in the research sample was confirmed. The research is preliminary in nature and presents the first stage of broader investigations of the analyzed topic. Small (65%) and medium-sized (35%) construction enterprises participated in the survey, with their activity focused on the construction of residential and non-residential buildings, demolition and site preparation, finishing construction works, roof structures and coverings, electrical, plumbing, heating, gas and air conditioning installations, construction of pipelines, telecommunication and power lines, and construction of roads and railways. The companies with more than 10 years of experience accounted for 53% of the entities surveyed, those with 6 to 10 years of experience accounted for 32%, while the remaining enterprises operated in the market for less than 6 years. The survey was conducted between April and May 2021.

The study was conducted using a survey questionnaire designed based on the literature review. The questionnaire consisted of two parts: 20 questions about the work safety culture and the impact of the pandemic on work safety, as well as particulars. The basic scale used in the questionnaire was a five-point Likert scale, with 1 meaning "Definitely worse" and 5 meaning "Definitely better".

The questions formulated in the research questionnaire were linked to three subject areas: physical environment, internal characteristics of the employee, and employee behaviour describing work safety culture.

The basis for the application of such a division was the literature analysis of the subject, based on which it was stated that changes in the work safety culture should apply to these areas. The survey was conducted using the CAWI (Computer-Assisted Web Interview) method. The questionnaire was addressed to people directly supervising work on construction sites, i.e., owners (33% responses), managers (45% responses), and occupational health and safety specialists (22% responses). The questions were designed so that a person who observes the work should be able to answer them.

A non-parametric statistical method based on Spearman's rank correlation coefficient was used for data analysis due to the nature of the Likert scale. Each time its significance was set at 0.05 and the Statistica 13 software package was used. Further analysis of the obtained results involved the determination of the arithmetic means for the responses presented on the interval scale. This was aimed to determine the level of changes in the studied aspects of work safety culture. As a five-grade scale was used in the questionnaire, it was assumed that the arithmetic means over 3 meant improvement, those at the level of 3 - no change, while the results below 3 meant a negative impact of the COVID-19 pandemic on WSC.

3. Results

For the analysis of results, non-parametric statistics in the form of Spearman's rank correlation were used first. Table 2 demonstrates a fragment of the relationship between the data about the enterprises and the respondents' answers to the posed questions. At this point, a significant negative correlation was noted (correlation coefficient ranging between -0.4 to -0.6) between the length of the functioning on the market and the number of overtime hours and the impact of restrictions on potentially accidental situations, and a significant positive relationship between the number of years on the market and the working atmosphere. There was also a clear correlation

between the number of years on the market and the impact of restrictions on the number of accidents at work.

Table 2.

The values of the Spearman rank correlation coefficients between the variables describing the work safety culture and the COVID-19 pandemic and the number of years of operation of enterprises.

Ordinal Variables	Spearman's Rank Correlation Coefficients
Number of years of operation & Breaking OHS rules	-0.18
Number of years of operation & Number of overtime hours	-0.42 *
Number of years of operation & Number of near-misses	-0.07
Number of years of operation & Impact of restrictions on the number of accidents	-0.34 *
Number of years of operation & Impact of restrictions on near-misses	-0.41 *
Number of years of operation & Motivation to activities related to OHS	0.21
Number of years of operation & Work atmosphere	0.47 *
Number of years of operation & Employee perceptions of the pandemic	-0.08
Number of years of operation & Long-term impact of the pandemic	-0.15

Source: Own study

Table 3 presents the values of Spearman's rank correlation coefficients for the answers provided by the respondents according to the ordinal scale. There is a significant positive correlation between the number of near-misses and number of accidents (0.56), as well as between concern for one's own safety and that of co-workers and the implementation of new protection measures (0.56). The same relationship can also be seen between employees' knowledge regarding OHS and providing personal and collective protective equipment (0.56), as well as between the number of near-misses and the number of overtime hours (0.45). On the other hand, there is a significant negative relationship between OHS communication and breaking OHS rules (-0.41). There is a clear negative correlation between the motivation towards activities related to OHS and such elements as: the number of overtime hours (-0.38), breaking the OHS rules (-0.38), the number of accidents (-0.30) and the number of near-misses (-0.35).

Table 3.
Values of Spearman's rank correlation coefficients between the elements of work safety culture.

Motivation to activities related to OHS	-0.07	0.35*	0.02	-0.22	0.10	-0.38*	0.23	0.35*	-0.38*	0.00	-0.30*	-0.35*	0.12
Employee's knowledge regarding OHS	0.25	0.56*	0.22	-0.15	-0.02	0.25	-0.07	0.02	-0.01	0.13	0.05	-0.01	
Number of near-misses	0.36*	-0.09	-0.03	0.34*	0.12	0.45*	-0.28	-0.12	0.34*	0.27	0.56*		
Number of accidents	0.44*	-0.07	0.15	0.24	0.32*	0.33*	0.03	0.07	0.19	0.28			
Concern for one's own safety and that of co-workers	0.20	0.12	0.31*	0.18	0.56*	0.11	0.09	0.04	0.12				
Breaking OHS rules	0.23	0.13	-0.02	0.10	0.27	0.36*	-0.41*	0.00					
Employee involvement in OHS issues	0.26	0.39*	0.26	0.17	0.37*	-0.01	0.12						
OHS communication	-0.01	-0.18	0.07	0.02	0.05	-0.11							
Number of overtime hours	0.01	0.13	0.13	0.17	0.02								
Implementation of new employee protective measures	0.19	0.28	0.17	0.21									
Detecting new hazards in the work environment	0.18	-0.05	-0.03										
Condition of machines and devices	0.14	0.09											
Providing personal and collective	0.20												
	Adaptation of the workplace in compliance with the requirements	Providing personal and collective	Condition of machines and devices	Detecting new hazards in the work environment	Implementation of new employee protective measures	Number of overtime hours	OHS communication	Employee involvement in OHS issues	Breaking OHS rules	Concern for one's own safety and that of co-workers	Number of accidents	Number of near-misses	Employee's knowledge regarding OHS

Source: own study

Work safety culture depends on many factors and their interrelationships are presented in Table 3. Therefore, they should be analyzed in more detail. However, the fact that out of 91 examined correlations, only 25 were statistically significant may demonstrate the uniqueness of individual information of the questions/variables and the validity of their selection in order to explain the examined phenomenon as fully as possible. Spearman's rank correlation coefficients were used for Tables 2 and 3. Due to the measurement scales used (with their small range) and the mostly stepwise nature of the tools, Spearman's correlation coefficient was proposed as an appropriate measure of correlations. The analyses used the Statistica software package, which takes into account the presence of pairs for the variables studied.

The pilot study also made it possible to illustrate changes in the work safety culture with the specification of activities included in the construction industry (Figure 1). It was noticed that the greatest positive changes occurred in the area of finishing construction works (3.4), demolition and preparation of the site for construction (3.329), and the construction of road and railroads (3.327). According to the collected network of responses, the smallest changes occurred in the enterprises dealing with construction and roofing (3.071). None of the analysed types of activity achieved negative changes in the area of work safety culture ($\bar{x} < 3$).

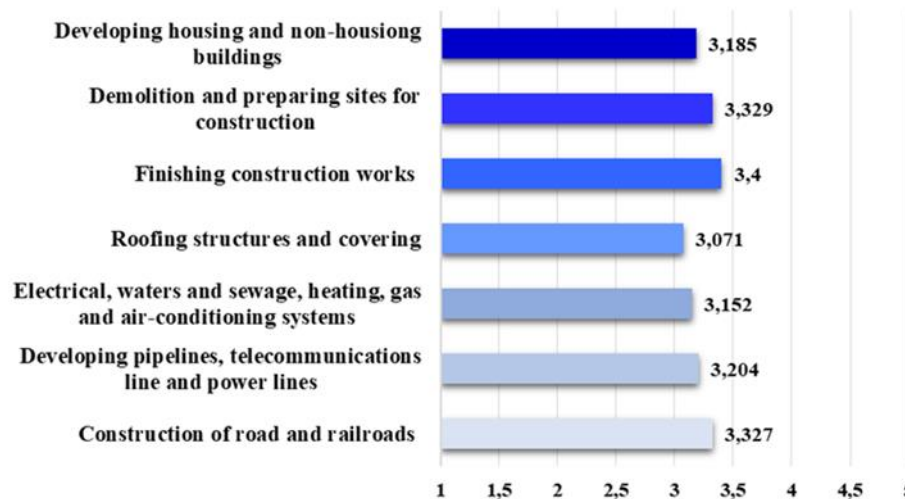


Fig. 1. Level of change in work safety culture, with a specification for the activity of the construction industry

From the point of view of the conducted research, it was important to assess the analyzed data on the culture of work safety and the situations that arose in connection with the implementation of restrictions resulting from the COVID-19 pandemic. Therefore, the research analysis covered the elements that were part of the individual areas of WSC and related to the COVID-19 pandemic (Figure 2). The indicated elements concerning WSC and the pandemic were assessed by the respondents during the research on the 5-point Likert scale, which allowed obtaining a more detailed opinion of the respondents. Figure 2 presents the assessment of individual areas of WSC and the COVID-19 pandemic, where 1 meant "Definitely worse" and 5 "Definitely better". For the purposes of the analysis, the numbers of questions from the survey were used, which refer to the individual variables defined on the interval scale. These elements include (Figure 2):

- physical environment - 1,2,4,5,6,10;
- internal characteristics of employees – 3,12;
- employee behaviour - 7,8,9,11,16.17;
- situations resulting from the COVID-19 pandemic - 13,14,15,18,19.

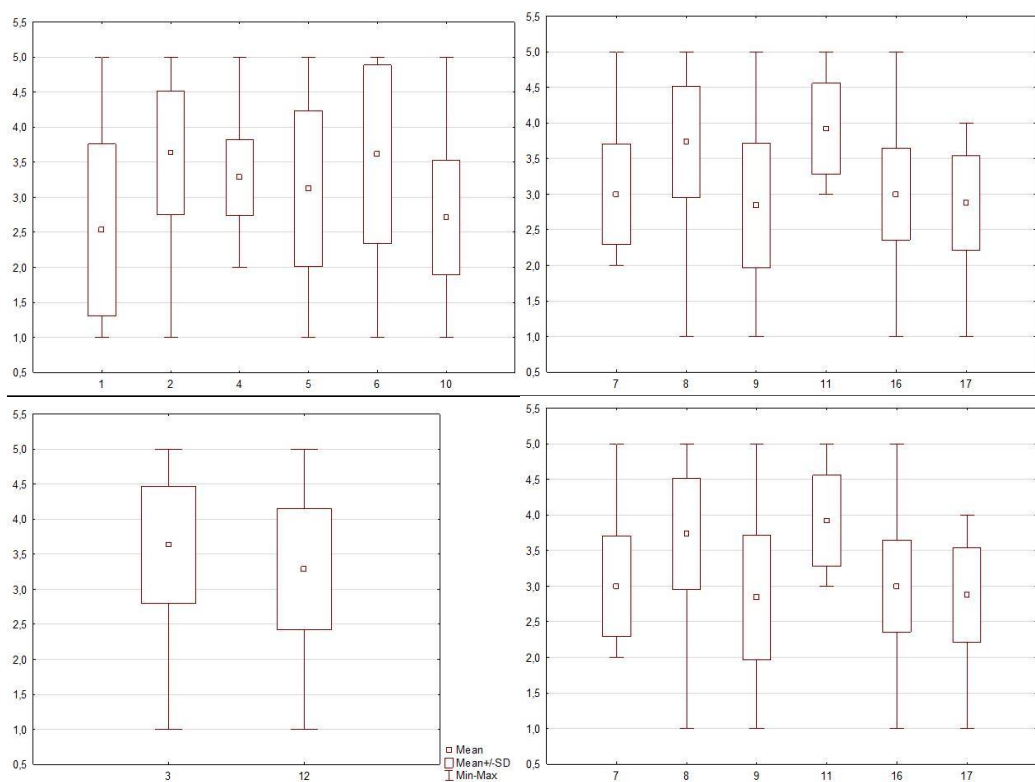


Figure 2. Assessment of the areas of work safety culture and situations resulting from the implementation of restrictions resulting from the COVID-19 pandemic, where: 1. Adaptation of the workplace in compliance with the requirements, 2. Providing personal and collective protective equipment, 3. Employee's knowledge regarding OHS, 4. Condition of machines and devices, 5. Detecting new hazards in the work environment, 6. Implementation of new employee protective measures, 7. OHS communication, 8. Employee involvement in OHS issues, 9. Breaking OHS rules, 10. Number of overtime hours, 11. Concern for one's own safety and that of co-workers, 12. Motivation to activities related to OHS, 13. Work atmosphere, 14. The long-term impact of the COVID-19 pandemic on the level of OHS, 15. Pandemic assessment, 16. Number of accidents, 17. Number of near-misses, 18. The impact of restrictions on the number of accidents, 19. The impact of restrictions on the number of near misses.

On the basis of the conducted research (Figure 2), it turns out that the highest-rated elements of the WSC, which obtained the average mark above 3.5, are:

- in the area of physical environment, these were the elements relating to the providing personal and collective protective equipment (2) and implementation of new employee protective measures (6),
- in the area of internal employee characteristics, an indication of the element employees' knowledge regarding OHS (3),
- in the area of employee behaviour, these were elements relating to employee involvement in OHS issues (8) and concern for one's own safety and that of coworkers (11). It is worth noting that they received the highest scores from the respondents: "concern for one's own safety and that of co-workers" (3,918) and "employee involvement in OHS issues" (3,735).

On the other hand, the implemented restrictions resulting from the COVID-19 pandemic, with the average score above 3.5, are items 15, 18 and 19. These include the assessment of situations resulting from the implementation of restrictions during a pandemic, which is taken seriously by employees (15). According to the respondents,

the introduced restrictions resulting from the pandemic did not affect the number of accidents at work (18), as well as the occurrence of near-misses (19).

It is worth noting that 8 out of 14 analyzed elements characterizing WSC, which were distinguished during the study, were assessed by the respondents at a level above 3.0, which proves that the COVID-19 pandemic had a positive impact on individual elements of WSC.

In the light of the conducted research, the COVID-19 pandemic had the greatest negative impact on such elements of the work safety culture as the number of overtime hours (2.714) and the adaptation of the workplace in compliance with the requirements (2.531).

The analysis of WSC elements and limitations resulting from the COVID-19 pandemic allows to specify and define the direction of activities that may contribute to the increase in the level of WSC and reduce the negative effects of implementing restrictions resulting from the COVID-19 pandemic.

The results of the research made it possible to summarise the general level of the areas of work safety culture. Positive changes were noted in each area. The internal characteristics of the employee scored the highest (3.459), while the smallest changes occurred in the area of the physical environment (Figure 3).

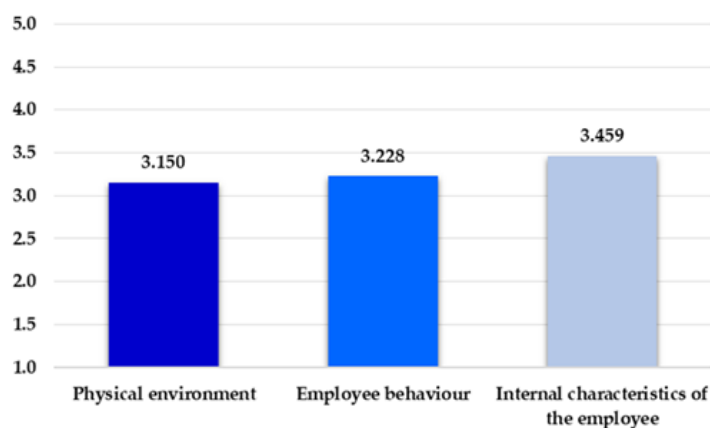


Fig. 3. General level of changes in the areas of work safety culture.

The study covered enterprises from the SME sector. During analysis, the enterprises were divided according to the number of employees (Figure 4). According to the results obtained, each area of work safety culture in medium-sized enterprises was higher than in smaller enterprises. According to the indicated division, each area obtained positive changes regarding WSC.

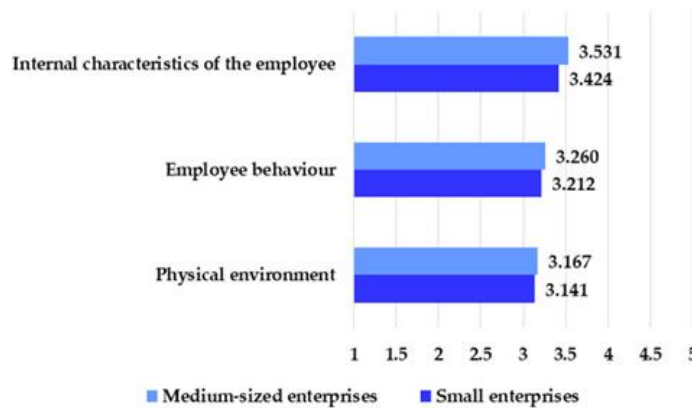


Fig. 4. Level of work safety culture with division versus size of the enterprise.

The last question in the survey was semi-open and read as follows: “Did you notice unusual behaviour or situations related to work safety caused by pandemic (e.g., Employee did not hear the warning against the threat by mask)?”. Respondents (10%) admitted that such events occur, usually indicating communication hindered by the mask, but also mentioned the detection of new threats, which were dirty water particles falling on the plastic visor during plumbing work. Before the pandemic, this was not noticed because the particles were too small and dried up quickly. The described situations pose a great threat to health and life noise is often present on construction sites, and the additional difficulty in the form of a mask may prevent the reception of the message. It is then worth to look for solutions for the safety of employees that will not increase the risk of disease, but will significantly simplify the work, e.g., an alternative communication system.

Overall, the COVID-19 pandemic had a positive impact on all areas of work safety culture in the construction industry under consideration, although negative impacts were noted for the individual components of these areas. Identification of these elements may lead to the introduction of additional security measures that will allow them to return to the pre-pandemic level and, in the future, develop a work safety culture.

4. Discussion

The considerations taken up herein lead to the conclusion that, despite the difficult situation, the pandemic had a positive impact on the work safety culture. Such a situation may result from the high level of employees’ awareness of the real danger and serious health consequences. Similar conclusions based on research conducted in China were indicated by Zheng et al. (Zeng et al., 2021). Being in a position in which it is hard to have a sense of security likely contributed to a higher level of safety culture, as workers, fearing the threat, tried to use their protective measures effectively. The conducted research indicates that it resulted in an increased concern for one’s own safety and that of co-workers, and a greater employee involvement in OHS issues. At this point, reference should be made to the research of S. Stiles et al. (Stiles et al., 2021), who, in their observations to a similar extent in the United Kingdom, noted a decrease in vigilance and awareness of OHS due to focusing on the pandemic. These differences may result from cultural differences, as well as a different approach to the strategy of fighting the virus: when Poland was subject to restrictions, an attempt was made in Great Britain to obtain herd immunity.

It should be noted that, in the course of this research, not all elements of the work safety culture have improved; therefore, entrepreneurs should pay particular attention to these elements when looking for new solutions. Excessive overtime hours can cause stress, fatigue, and irritation, which can lead to health and safety violations or accidents, but it can also have an impact on the mental health of employees, which should be especially cared for during the COVID-19 pandemic, as emphasized by Choi and Staley (Choi and Staley, 2021). Overtime may result from delays in scheduled work, which is a global problem, also described by Wang et al. (Wang et al., 2020). A major problem was the adaptation of the workplace in compliance with the requirements, which is also confirmed by Moyo (Moyo, 2020). Ensuring safety measures is a priority for the employer, even without the pandemic. It can be assumed that such problems will arise until employers understand that employee safety equals profit. On the other hand, workers need to understand that neglecting protective measures first and foremost harms themselves, but also exposes society as a whole to hazards. The conducted study also revealed a decrease in the level of WSC in such elements as occupational violation of health and safety regulations and potentially accidental situations. There was also a noticeable decline in these aspects in the observations of Stiles et al. (Stiles et al., 2021). Similar conclusions can also be found in the work of Jones et al. (2021), where it was noted that the accident rate did not change, while some employees indicated an increase in involvement at various levels of work positions (Jones et al., 2021). Furthermore, it should be emphasised that the study reveals that enterprises with employment between 50 and 249 show a greater improvement in the level of work safety culture than small enterprises. Alar (Alara, 2021) observed a similar situation in his research therefore, while conducting further research in this direction, it is worth separating these sizes of enterprises and making separate considerations.

5. Conclusion

The COVID-19 pandemic has had a significant impact on the quality of lives people and has created limitations in many areas life. In the case of enterprises, the pandemic was particularly concerned with occupational health and safety, as it was this department that had to ensure that enterprises could continue to operate in a turbulent environment. Construction companies were those economic entities that could not stop their work due to the necessity to provide services; therefore, the employees of these companies were constantly exposed to the pandemic threat resulting from constant contact with one another. Thus, the management was responsible for creating an appropriate security policy in response to unprecedented and unknown threats.

The main aim of the study was to determine whether the COVID-19 pandemic has influenced on the safety culture. The conducted pilot study shaped the main conclusion, which confirms the changes in the work safety culture, and most of the results were positive. When analyzing the results of the research, it can be noticed that the COVID-19 pandemic generally had a positive impact on all areas of the WSC, i.e., the physical environment, employee behaviour and internal characteristics of employees. However, it should be emphasized that some elements of these areas COVID-19 pandemic had a negative impact on. The elements of the WSC with the lowest results are: the adaptation of the workplace in compliance with the requirements and the number of overtime hours. Research also shows that situations resulting from the implementation of restrictions have a negative impact on the atmosphere at work. It is worth emphasizing that, according to the research, the employees' concern for one's own

safety and that of co-workers has increased, which is related to the serious treatment of the threat of COVID-19. Such an approach of staff contributes to the development of the level of work safety culture. At this point, it should be noted that the research undertaken is the initial stage of more extensive considerations aimed at assessing the impact of the COVID-19 pandemic on construction companies in Central and Eastern Europe. The study limitation mainly relates to the small research group that was the basis of the pilot studies. It should also be remembered that the study was conducted in one region of Poland, which is also a limitation. It is also worth noting to the fact that the analysis of the literature on the impact of the COVID-19 pandemic on work safety shows that publications in this area are primarily aimed at workers most exposed to the coronavirus, i.e., healthcare professionals (Boluarte et al., 2020; Chen et al., 2021; Fassarella, 2021). When defining the directions for further research, it seems beneficial to consider the impact of the COVID-19 pandemic on various industries. Such actions by researchers will provide a more complete picture of the COVID-19 pandemic in terms of work safety culture.

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