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## Mapping Occupational Health and Safety Management Systems in Portugal: outlook for ISO 45001:2018 adoption

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### Abstract

Occupational Health and Safety (OHS) is a set of activities to prevent injuries and health problems to workers and to provide safe and healthy workplaces (ISO 14001:2015). According to the International Labor Organization (ILO), more than 2.3 million people lose their lives each year in their professional activities and more than 300 million work-related accidents occur. The impact on companies is significant and most of these accidents could have been avoided. Thus, it is necessary that they address health and safety at work in a systematic and integrated way. Given the relevance of ISO International Standards, the International Organization for Standardization (ISO) has created a Project Committee consisting of a team of specialists in OHS to develop ISO 45001 - Occupational Health and Safety management systems - requirements, which was published in 2018. Among the benefits that ISO envisage will come from the implementation of ISO 45001:2018, some issues assume higher importance, such as increased productivity, reduction of costs of stoppages and losses of production, reduction of costs with insurance and lost work days, improvement of the quality of products or services, among others. This work aims to characterize the Portuguese reality, regarding the relevance given to OHS, independently of the sector of activity or size of the companies. Approximately 500 companies (certified and uncertified) were invited to participate through an online survey, with open and closed questions. After processing the data from the 94 valid responses, it was possible to conclude that 98% of these companies are aware of the benefits that OHSMS provides or could provide. Also, 75% of them comply with ISO 45001 requirements, namely concerning the establishment and monitoring of measurable annual targets for OHS, the implementation of the risk prevention program and internal audits to evaluate OHS concerns.

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## 1. Introduction

The concern of all types of companies with the workers' working conditions is constant. There is a growing need to achieve and demonstrate strong Occupational Health and Safety (OHS) performance by monitoring occupational hazards [1]. However, this performance should be consistent with the companies' OHS policy and goals. The basis of this reality is a context of increasingly restrictive legal requirements, economic policy development and other measures that drive OSH good practices, and the growing concern expressed by stakeholders on OHS issues [2].

There is the assumption that, for the majority, companies do not view occupational health and safety as cost-benefit-oriented management [3], thus assuming OHS as a cost that is necessary minimize, privileging as minimum objective the fulfilment of the legal requirements that are imposed by the regulatory entities [4]. On the other hand, companies that view occupational health and safety as an investment with return [5], are faced with a wide range of benefits, such as the reduction of absenteeism, the motivation of workers, increased productivity and the reduction of labour accident costs. Due to the increased media exposure that occupational accidents have been acquiring, and the consequent pressure exerted by society, some companies have already begun to address occupational health and safety in a systematic and integrated way, making use of normative supports [6], as has been the case with Quality Management (e.g., ISO 9001) and Environmental (ISO 14001) Management Systems.

Due to the lack of consensus, there is a need to clarify the origin of OHS concerns, whether it is with the focus on workers and the companies' sustainable performance, or only for the purpose of legal compliance [7]. The present study aimed to assess the status of readiness of Portuguese companies for ISO 45001 certification and if these firms consider Occupational Health and Safety Management System (OHSMS) beneficial. According to ISO, ISO 45001:2018 [8] brings added value in terms of sustainability in companies, since the certification will have an impact on the better performance of employees, on stimulating innovation, on the involvement of all stakeholders and the continuous improvement of their processes. On the other hand, experience shows that every euro that an employer invests in OHS translates into a return over double [9]. To that end, it was necessary to characterize the companies' perception of health and safety at work and to evaluate the importance of OHSMS for each of them. Thus, information was collected through an online questionnaire with open and closed questions, a statistical analysis was performed after the data collection phase, mapping the status of OHS in Portuguese companies. The rest of the paper is organized as follows. Chapter 2 presents the Literature Review and is followed by the Methodology in chapter 3. The Results are presented in chapter 4, and the conclusions (chapter 5) summarize the status of Portuguese companies concerning OHS and the theoretical and practical implications of this investigation.

## 2. Literature review

OSH is a set of matters that take care of the prevention of accidents and occupational diseases, as well as of the protection and promotion of workers' health. The topic remains relevant in the present digital society, as Industry 4.0 should be developed without disentangling OHS, optimizing prevention in this matter [10]. According to ISO 45001:2018 [8], OSH is a set of activities to prevent injuries and health problems to workers and to provide safe and healthy workplaces. The entire company is responsible for the health and safety of workers and others who are affected by its activities. This responsibility includes the promotion and protection of their physical, psychological and mental health [11].

According to the latest estimates provided by the International Labor Organization (ILO), 2.78 million workers die each year from work-related accidents and diseases. Approximately 2.4 million of these deaths are caused by occupational diseases and more than 380,000 results from work-related accidents. The highest number of injuries are caused by occupational diseases and non-fatal accidents, affecting more than 300 million workers annually [12]. The impact for companies is significant and most of these accidents could have been avoided if occupational health and safety is addressed in a systematic and integrated way [13].

Due to the greater media exposure that occupational accidents have been acquiring, and the consequent pressure from society, some companies have already begun to address OHS in a systematic and integrated way, using normative supports [6]. From the point of view of risk prevention, it has been argued that the use of advanced quality management systems has helped to reduce accident rates since quality management methods are based on the principle of prevention rather than corrective actions. Thus, the concept of OHSMS has become common in the last

20 years [14], and is considered a strategic priority, providing an opportunity for eliminating or reduce potential factors of value destruction for companies, and to become more competitive and, consequently, to promote their sustainable success [15]. Risk prevention aims to eliminate or reduce the occupational risks to which workers are potentially exposed; however, in most companies, prevention is still seen as a cost or barrier to the normal functioning of the companies [16]. On the other hand, and as previously mentioned, companies are already starting to take preventive measures with the objective of reducing the rate of accidents at work. An OHSMS results in a better company's ability to create conditions for safe and healthy workplaces, preventing work-related injuries and/or health problems (ISO 45001: 2018) [8]. The progressive, intensified and generalized adoption of different management models by companies is a reality that is justified either by competitive factors or by demands from clients or other relevant stakeholders [17].

The aim and intended outcome of the OHSMS is to prevent injuries and health problems related to work activities in workers, and to provide a safe and healthy workplace; consequently, it is imperative for the companies to eliminate and minimize OHS risks by taking effective prevention and protection measures. Thus, measurement of OHS operations that may have an impact on legal requirements, operational controls, risks, opportunities, and OHS performance, ensuring their progress towards the defined objectives is essential (ISO 45001:2018) [8]. All ISO standards related to management are based on the Deming's or PDCA cycle (Plan - Do - Check - Act), usually referred to as the continuous improvement cycle [18]. The International Organization for Standardization (ISO) has set up a Project Committee consisting of a team of specialists in OHS to develop ISO 45001:2018 - Occupational health and safety management systems - requirements with guidance for use [8], which was published in 2018. This International Standard has adopted the common high-level structure for all ISO Management System Standards (MSSs), with identical core text, terms, and definitions, to ensure compatibility and foster easier implementation and integrating of ISO MSS with the management systems of organizations, first implemented with ISO 9001:2015 [26]. According to ISO 45001:2018 [8], this model provides an interactive process, as shown in Fig. 1, used by companies to achieve continuous improvement. It may be applied to a management system and to each of its individual elements as follows:

- a) Plan: establish and evaluate OHS risks, OHS opportunities, other risks and other opportunities, establish OHS goals, and the processes required to achieve results according to the company's OHS policy;
- b) Execute: implement the processes as planned;
- c) Check: monitor and measure activities and processes in relation to OHS policy and OHS goals, and report the results;
- d) Acting: take actions to continuously improve OSH performance to achieve the intended result

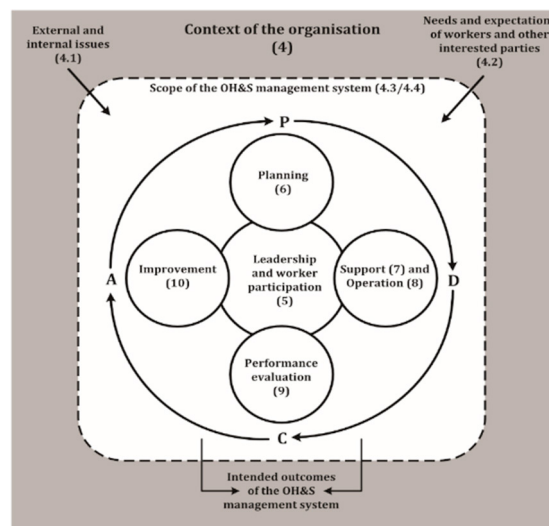


Fig. 1. The productive flow of the production line.

There are several potential benefits that come from the implementation of ISO 45001:2018 [8], such as, increased productivity, reduced costs inherent to stoppages and production losses or defects, reduction of costs with insurance fees and lost work days, improvement of the products quality or services provided, among others [19]. The period for companies that have their OHS management systems certified according to NP 4397:2008 [2] and OHSAS 18001:2007 [20] standards to be transposed to ISO 45001:2018 [8] is 36 months. This period shall run from March 12, 2018, to March 12, 2021, after which all audits shall be performed in accordance with ISO 45001:2018 [8].

Since improvement continues to be a necessity for today's companies, especially those that want to compete in the global marketplace, OHSMS cannot be ignored in companies subject to total quality management systems. Total quality is fundamental for companies to be continuously focused on knowing, eliminating, reducing and controlling causes that interrupt and compromise the expected performance, and companies that are focused on OHS, have additional advantages over others that do not view OHS as an added-value, while negligent security will negatively impact the company sustainability [21].

The implementation of the requirements of International Management Systems Standards can be audited and certified by an independent external entity, an independent certification body (called the CB - certification body), to assess if it complies with the applicable International Standard requirements and achieves the intended results. Following the successful certification, the CB issues a certificate of conformity allowing the certified organization to evidence that it has implemented the standard and is successfully operating the applicable management system [27]. With the adoption of ISO 45001, certified firms will be able to demonstrate that they fulfil the applicable requirements and generate confidence to its stakeholders.

### **3. Methodology**

The present study followed a deductive research approach, initially through a review of the literature on OHSMS, its advantages/disadvantages and the perception of companies on this issue. Regarding the research strategy, in order to characterize the Portugal's reality regarding the importance given to OHS, regardless of the sector of activity or the size of the companies, an approach was performed to approximately 500 companies (certified and not certified), classified as small, medium and large companies, through an online survey (Survey) with open and closed questions. The questionnaire consisted mostly of questions of closed response, where the response scale was three points ("Yes", "No" and "Partially"), and for one open response.

The first part of the questionnaire consisted of the identification of the companies, being optional the identification of the respective social denomination. However, its characterization was assured, indicating the number of employees and their geographical location. Concerning the second part of the questionnaire, it focused on its company on OHS and the type of services provided by the companies (internal or external/separate or joint). In the third part, the emphasis was placed on the OHS management system, to observe whether companies have an OHS management system implemented or in the implementation phase. Several questions were also raised in accordance with the requirements of ISO 45001:2018 to ascertain how certified companies meet the requirements. Finally, the fourth part of the questionnaire focused on OHS Certification, focusing on the main benefits that companies consider resulting from the certification of an OHS management system, and what conclusion they draw on this: Is safety a cost or a benefit? For the treatment of the data, and in order to perform a critical analysis of the results achieved with this study, MS Excel® was used.

After completing the questionnaire, three companies were contacted via e-mail to validate the questionnaire and at the same time give their opinion on the questions asked and the study presented, so that changes can be made in accordance with the comments and suggestions. Once the necessary answers were gathered, the questionnaire was validated, and since there was no need to review it, the study was started, and its data collected. The companies that validated the questionnaire were not considered in the study data. At the beginning of the questionnaire, participants were informed of the confidentiality of their participation and the voluntary nature of participating in the study. The results were monitored during the survey period and the answers from early respondents were compared with those of the later ones, to assess potential non-respondent bias.

For the preparation of this study, 483 Portuguese companies were contacted (mainland, Azores and Madeira), of which 174 have their OHS management system certified according to NP 4397:2008 [2] and OHSAS 18001:2007

[20]. At the moment of the study, there were still companies certified by ISO 45001:2018 [8] and 309 companies do not have an OHS certificate management system.

#### 4. Results and Discussion

The sample of this study had 94 participating companies, representing 19.46% of the population. Of the 94 participating companies (mainland, Azores and Madeira), 61.3% ( $n = 57$ ) are companies certified in OHS, 31.2% ( $n = 29$ ) are companies not certified in OHS and 7.5% ( $n = 7$ ) are companies that are in the process of certification in OHS (Fig. 2).

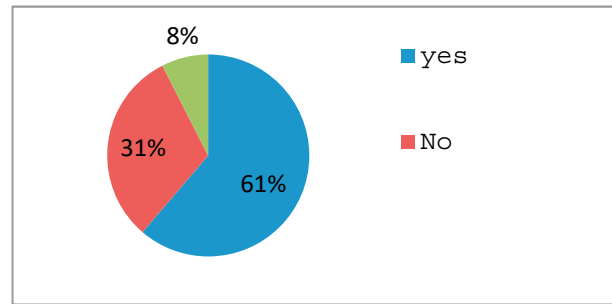


Fig. 2. Sample sorting regarding the companies' certification in OHS.

Regarding the geographical location of the entities contacted, the main objective was to cover Portugal from North to South of the country, including the Autonomous Regions of the Azores and Madeira. Thus, 40.9% of the sample belong to the North region ( $n = 38$ ), 31.2% are in the Central region ( $n = 29$ ), 14% are in the South region ( $n = 13$ ), only 3.2% in the Autonomous Region of Madeira ( $n = 3$ ) and 10.8% in the Autonomous Region of the Azores ( $n = 10$ ) (Fig. 3).

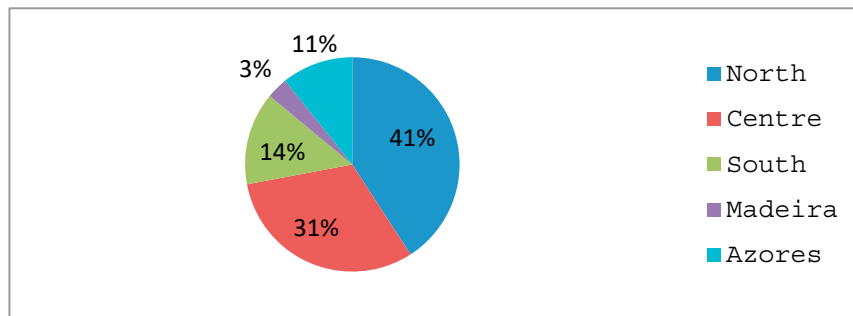


Fig. 3. Distribution by region of the companies (Sample).

Regarding the number of employees that the participating entities in this study report having at the service of their company, 30.1% are small companies with between 0-50 employees ( $n = 28$ ), 21.5% are companies constituted by 50-100 ( $n = 20$ ) employees, 21.5% of the participants have between 100-200 employees ( $n = 20$ ), and finally, 26.9% of the sample are large companies with more than 200 employees ( $n = 25$ ) (Fig. 4).

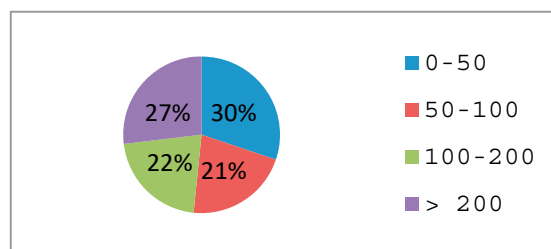


Fig. 4. Distribution by size/number of employees of the companies (Sample).

After treatment of the study data, and taking into account the responses directly related to the sustainability of the companies, the following questions and responses were obtained:

A - "Does your company set measurable annual targets for OHS?"

Each company should define objectives that it intends to achieve according to its OHS performance (ISO 45001) [8]. In the case of OHS certified companies, and as a requirement of OHS (requirement 6.2), the company shall "establish, implement and maintain OHS goals documented for relevant functions and levels of the company". Thus, 74% of the companies participating in this study ( $n = 69$ ) stated that they set annual goals for OHS (Fig. 5). This figure shows that 13% of non-certified companies have this practice. Not being a legal requirement, it positively reflects the top management's concern with the OHSMS in their companies, noting that in many cases the pressure caused by top management at all hierarchical levels of companies is causing stress at work [22]. Also according to ISO 45001:2018 [8], the objectives set for assessing OHS performance should be:

- Measurable;
- Consistent with the OHS policy;
- Include a commitment to prevent injuries and health affections;
- Include a commitment to comply with legal requirements or other application requirements to the company;
- Promote continuous improvement.

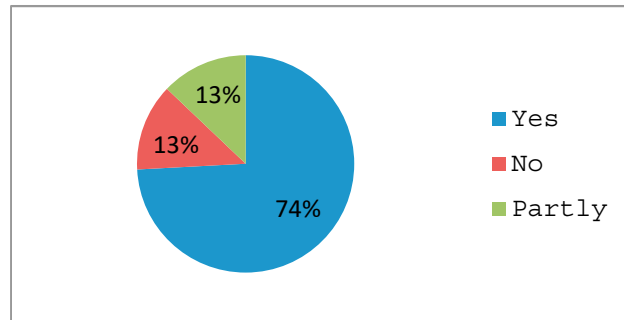


Fig. 5. Percentage of the surveyed companies that present goals for OHS.

B - "Are there systems for performance evaluation or statistics to monitor OHS goals?"

Periodically, companies should measure and monitor occupational health and safety performance (ISO 45001:2018, requirements 6.2/9.2) [8]. To this end, they should include quantitative and qualitative measures in their performance appraisal, monitor the achievement of defined objectives, the effectiveness of controls, proactive and reactive measures of performance, and record the monitoring data. For the question asked, 75% ( $n = 70$ ) of the companies declared that they have performance evaluation systems or statistics that allow monitoring the objectives (Fig. 6), which shows consistency with the 74% of the surveyed companies that declared have OHS well-defined goals. Thus, it can be concluded that the companies that defined goals, guaranteed the necessary means to monitor them.

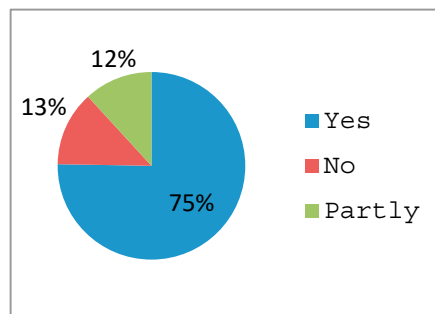


Fig. 6. Percentage of the surveyed companies that monitor their goals regarding OHS concerns.

### C - "Is there a professional risk prevention program?"

In order to control and identify all occupational risks resulting from the activities of companies, they should promote the implementation of a professional risk prevention program. The professional risk prevention program should consist of the characterization of the company through its policy (if it is defined), the planning of activities (identification, assessment and control of occupational risks, analysis of work accidents, internal inspections and audits, workers, among others) and associated documentation. This Program may be a single document, which is made available to all employees and other stakeholders of the company. In the analysis of the results, it is observed that in 88% ( $n = 78$ ) of the companies participating in this study, there is a professional risk prevention program (Fig. 7), which shows that there is 27% of companies not certified with this program. This situation was not expected and, by itself, already demonstrates the concern of companies with this issue.

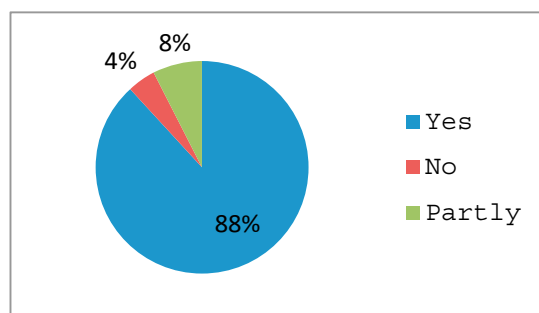


Fig. 7. Percentage of the surveyed companies that present professional risk prevention programs.

### D - "Do audits and/or security inspections regularly?"

In order to control the working conditions to which the employees of a given company are subject, it must promote the performance of audits by specialized technicians, through control visits to the health and safety conditions in the company's workplaces. There, the working conditions of the occupational health and safety services, work equipment, personal protective equipment and equipment for the evaluation of occupational health and safety conditions must be evaluated (Law no. 102/2009 of 10 of September, as amended by Law 3/2014 of January 28 - Portuguese Legislation). The results show that in 95% of the companies ( $n = 78$ ), regular audits and/or safety inspections are carried out on a regular basis (Fig. 8), which demonstrates that this concern and practice is not associated with certification companies, as these are 34% more than the certified companies whose value is 61%. This is a very positive situation since audits are voluntary activities.

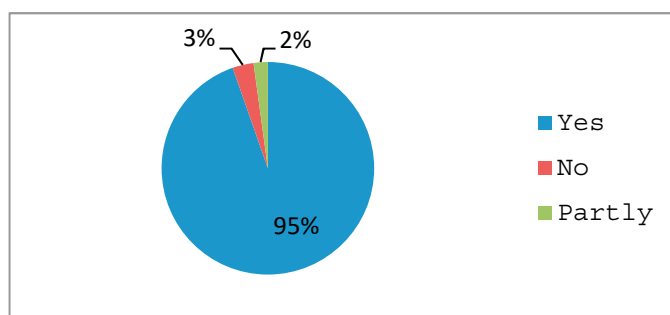


Fig. 8. Percentage of the surveyed companies that carry out internal audits regarding OHS concerns.

E - "What are the benefits of a workplace health and safety management system implemented in your company?"

The companies participating in the study identified the main benefits of a workplace health and safety management system implemented by companies (Fig. 9).

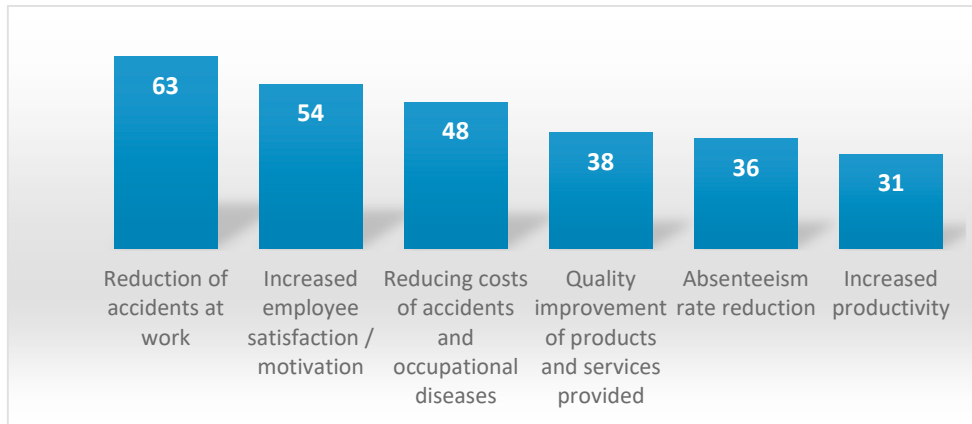


Fig. 9. Factors pointed out by respondent companies as benefits when implemented an OHSMS.

The main benefits pointed out by the respondent companies were the reduction of work-related accidents, followed by an increase in employee satisfaction/motivation, reduction of costs with accidents and occupational diseases, and improvement of the quality of products and services provided. Reduced rates of absenteeism and increased productivity were also identified as benefits. Interestingly, the increase in employees' satisfaction/motivation confirms the need to involve them in this issue through awareness-raising and training [23]. It is also important to highlight the need for companies to evolve with new technologies and, in this sense, OHSMS will also have to evolve and withstand innovative transformations, never forgetting the principles of prevention [10]. It is also considered that the social concern of companies may be the basis for increased concern with the OHSMS [24]. This analysis allows concluding that companies are aware of the benefits of OHSMS, both financially and resource level and the quality of the products and services provided, whether the system is implemented.

F - "Do you consider OHSMS a cost or benefit?"

Analyzing one of the most relevant issues in the present study, 98% (n = 91) of the companies consider that occupational health and safety management is a benefit (Fig. 10). This value is 37% higher than the number of certified companies, which clearly exceeded the initial expectations.

Given these results, it can be concluded that most companies are aware of the importance of occupational safety and health management systems and, consequently, of the benefits that it can bring to sustainability. These results highlight the focus of OHSMS leadership and enable companies to evolve and improve sustainability [16]. It can also be considered that despite the investments required for the OHSMS, it is fundamental to realize that they bring a return, fundamentally when financial crises arise because companies must continuously improve their management dynamics [25].

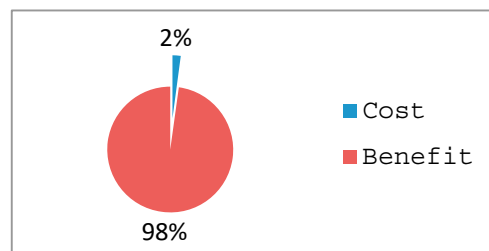


Fig. 10. Percentage of the surveyed companies that realize OHSMS as a cost or benefit.



## 5. Conclusions

The present study arises from the need to evaluate the awareness of Portuguese companies for the management of occupational health and safety, as well as to understand if this issue is considered by these companies, namely with respect to their benefits and their influence in the sustainability of companies. The work started by the elaboration of a survey with open and closed answers, which was validated by three selected stakeholders.

Through the analysis of the results, it was verified that 61% of the respondent companies are certified in OHSMS (Fig. 11). It should be noted, however, that OHSMS concerns are evidence in reporting companies, whether or not they are certified. Thus, 74% define goals and perform their monitoring and evaluation of performance; 88% have a Professional Risks Prevention Program; 95% carry out audits/inspections of its OHSMS and 98% consider that the OHSMS brings benefits to the company. The benefits identified by companies are mainly focused on reducing work-related accidents, increasing employee satisfaction/motivation, reducing costs of accidents and occupational diseases, improving the quality of products and services, reducing absenteeism and increasing productivity.

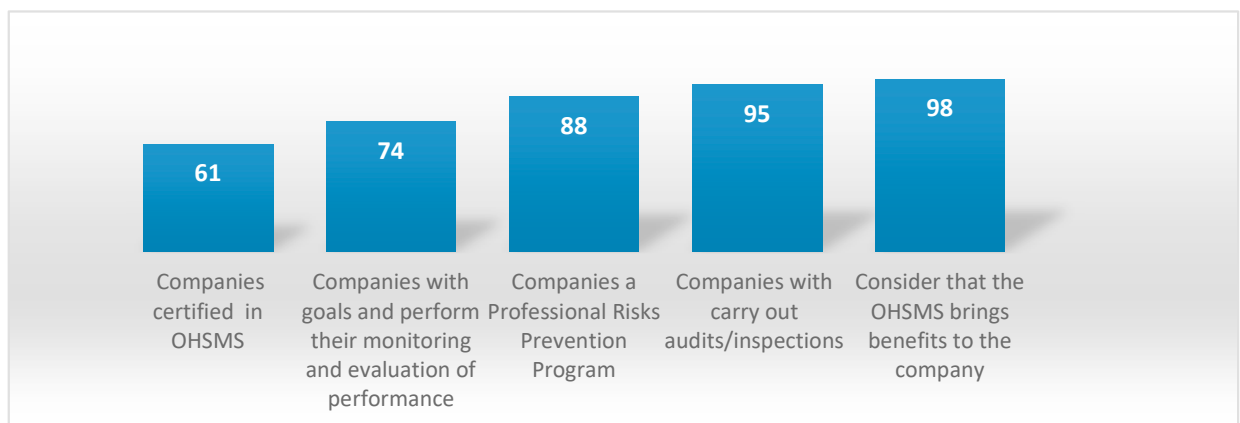


Fig. 11. Overall analysis of results

Due to ISO 45001 novelty, it would be important to carry out a new study, later, to evaluate the status of ISO 45001 in Portugal, namely the transition from OHSAS 18001 certification and new ISO 45001 certifications. Given the above, it is possible to conclude that the companies know the added value that OHSMS provides them and, consequently, the improvement of their image and position in the market. However, the main step, which is to advance with the implementation of the normative reference ISO 45001, is still not evident.

It was verified that there is still a small lack of knowledge about the legal obligations that companies must comply with. This question would give a new topic of study. The companies identified the main difficulties experienced in the adoption of safety and health measures, namely the lack of, safety culture and safety awareness by employees, lack of use of personal protective equipment, and the need for management participation and complying voluntarily and consciously with safety rules by employees. Implementing an OHSMS is a strategic and operational decision for a company. The success of the OHSMS depends on the leadership, commitment, and participation of all levels and functions of the company (ISO 45001:2018) [8]. Thus, it was important that in future studies the focus should be on issues related to the top management of the companies. The present study could also be complemented with a question that characterizes the companies according to their sector of activity, in order to compare their perception with the OHSMS. A similar study may be carried out, but on a European scale, with the aim of verifying the different approaches to OHSMS in different regions, and the difficulties that companies face in the course of the implementation of ISO 45001:2018 [8]. In short, despite the difficulties in obtaining answers, this study brings both theoretical and practical contribution to the implementation of the new ISO 45001 International Standards. Encouraging companies to reflect on OSHMS and its influence on the company can ensure its success and sustainability. Thus, it may be mentioned as the main scientific contribution of this work the achievement of a much more reliable image of the behaviour of Portuguese companies regarding OSH issues.

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