

FORUM

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OCCUPATIONAL HEALTH AND SAFETY: QUALITY AND DETERMINANTS OF ITS DISCLOSURE IN SUSTAINABILITY REPORTING

Saúde e segurança no trabalho: Qualidade e determinantes da sua divulgação no relato de sustentabilidade

Salud y seguridad en el trabajo: Calidad y determinantes de su divulgación en los informes de sostenibilidad

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ABSTRACT

This study analyzes the quality of occupational health and safety (OHS) disclosures and their determinants, taking as a sample the reports of 101 European Union (EU) companies included in the official database of the Global Reporting Initiative (GRI) for the year 2018. Content analysis served to build the quality index regarding the companies' OHS disclosures. The index was then used as a dependent variable in one-way ANOVA and multiple linear regression models. We found that the quality of OHS disclosures is, on average, 12 points out of 30, which is significantly influenced by three determinants: the region of Europe, certification of the OHS management system, and external assurance of the reports. There is higher quality in Northern Europe, followed by Southern Europe, compared to Central and Eastern Europe, and Western Europe.

Keywords: GRI standards, quality, sustainability reports, corporate social responsibility, occupational health and safety.

RESUMO

Este estudo analisa a qualidade das divulgações de saúde e segurança do trabalho (SST) e as suas determinantes, tendo como amostra os relatórios de 101 empresas da União Europeia integrantes na base de dados oficiais da GRI, para o ano de 2018. A análise de conteúdo permitiu a construção do índice de qualidade das divulgações de SST das empresas. Tal índice é posteriormente utilizado como variável dependente dos modelos ANOVA de um fator e de regressão linear múltipla. Conclui-se que a qualidade das divulgações de SST é, em média, 12 pontos em 30, sendo que esta é significativamente influenciada por três determinantes: a região da Europa, a certificação no sistema de gestão de SST e a detenção de garantia externa nos relatórios. Verifica-se uma maior qualidade na região Norte da Europa, seguindo-se a do Sul da Europa, face à Europa Central e Oriental e à Europa Ocidental.

Palavras-chave: GRI standards, Qualidade, Relatórios de Sustentabilidade, Responsabilidade Social Empresarial, Saúde e Segurança do Trabalho.

RESUMEN

Este estudio analiza la calidad de las divulgaciones de seguridad y salud en el trabajo (SST) y sus determinantes, utilizando como muestra los informes de 101 empresas de la Unión Europea incluidos en la base de datos oficial de la Global Reporting Initiative (GRI) para el año 2018. El análisis de contenido permitió la construcción del índice de calidad de las divulgaciones de SST de las empresas, utilizado posteriormente como variable dependiente del ANOVA de un factor y de los modelos de regresión lineal múltiple. Se ha concluido que la calidad de las divulgaciones SST es, en promedio, de 12 puntos sobre 30 y que está influenciada significativamente por tres determinantes: la región europea, la certificación en el sistema de gestión de SST y la tenencia de una garantía externa en los informes. Se ha registrado una calidad más alta en el Norte de Europa, seguida por el Sur de Europa, en comparación con Europa Central y Oriental y Europa Occidental.

Palabras clave: estándares GRI, calidad, informes de sostenibilidad, responsabilidad social corporativa, salud y seguridad laboral.

INTRODUCTION

Every year, around three million deaths are associated with work-related accidents and illnesses, and more than 370 million non-fatal accidents occur worldwide (International Labour Organization [ILO], 2019). Takala et al. (2014) associate these disturbing numbers with a negative economic impact of 4% in terms of world gross domestic product (GDP) and report that, in some countries, this value rises to 6% or more.

The European Pillar of Social Rights (EPSR) highlights in its principle 10 that "workers have the right to a high level of protection of their health and safety at work". Despite the growing attention paid to OHS, there is still a lack of recognition given its material weight for corporate financial health. For this reason, the human right to a healthy and safe workplace is being jeopardized, in many cases penalizing the most vulnerable party, the worker. OHS is represented in three of the UN's 17 sustainable development goals as part of Agenda 2030.

The literature suggests that OHS is a relevant matter for several stakeholders such as companies, shareholders, workers and their families, trade unions, regulators, health care providers, insurers, and society (International Labour Organization, 2013). To influence society's perception and ensure the preventive nature of OHS, its communication, usually through sustainability reports, has become integral not only to organizational performance but also to daily management (Araújo & Ramos, 2015; D. Malan, Radjy, Pronk, & Yach, 2016). This matter presents challenges for the sustainable and socially responsible human resources management of organizations (Westerman, Rao, Vanka, & Gupta, 2020).

This study aims to address concerns raised by international bodies regarding the need to pay greater academic attention to the OHS disclosures of enterprises. Thus, to analyze the quality of OHS disclosures and the factors that influence such quality, we will focus on the most recent update of the Global Reporting Initiative (GRI) Standards, particularly its OHS guidelines, which we will label GRI 403: OHS 2018 in this paper. The sample we have gathered consists of 101 EU companies, belonging to the four regions of Europe, namely, Central and Eastern, Northern, Southern, and Western Europe, whose integrated or sustainability reports for the year 2018 are available in the official GRI database. Two research questions will be addressed.

1. What is the level of quality of the OHS information disclosed by the companies?
2. Is the quality of the companies' OHS disclosures influenced by the region, sector, OHS management system, size, external assurance, capital market listing, and whether the company is multinational?

THE IMPORTANCE OF OCCUPATIONAL HEALTH AND SAFETY IN SUSTAINABLE MANAGEMENT

OHS concerns the promotion, prevention, and maintenance of the highest degree of physical, mental and social well-being of workers (Montero, Araque, & Rey, 2009).

Economic dimension and promotion of OHS

The companies' approach to OHS is primarily aimed at reducing the workers' compensation costs, leaving aside the benefits to their investments and the total costs borne by the organization, workers, and society (Tompa, Dolinschi, & Oliveira, 2006). However, occupational accidents and illnesses have manifold impacts on companies and can represent significant financial losses (Freitas, 2016).

Investing in OHS contributes to the well-being of workers and proves to be profitable. Several studies have shown that each euro invested in OHS yields twice as much for employers (European Commission, 2017a). The logic of investing in OHS is rooted in the avoidance of accidents and illnesses at work, thus reducing risks and lowering costs (Fabius et al., 2013). The challenge lies in maintaining a culture of prevention that encompasses society as a whole (Walters, 2005). The adoption of preventive measures is widely underrated, and despite the progress achieved in laws and inspections, the working conditions for most workers in the world do not meet the established minimum standards (ILO, 2019).

To ensure sustainable economic and social development, global approaches to OHS are fundamental, especially considering the informal economy, the growth of emerging risks, and the physical, mental, and social well-being of workers. It is also crucial to continuously implement dissemination actions that can lead to greater awareness among the parties involved, improving the means of communication (Ramos & Patrício, 2018).

Benefits of OHS in Corporate Social Responsibility (CSR)

A safe and healthy workplace, as well as the promotion of a culture of risk prevention, are two of the principal social responsibilities of a company (Montero et al., 2009). In the absence of a universal definition, the European Commission (2011) defines CSR as "the responsibility of enterprises for their impacts on society" (p. 7).

The link between OHS and CSR leads to benefits for companies, particularly in terms of image, reputation, customer loyalty, increased productivity, and financial results (Montero et al., 2009). Additional benefits are visible to shareholders, as information on OHS activities is useful in analyzing the company's long-term performance (Nagata et al., 2017). Conradie, Smit, and Malan (2016) mention positive impacts on the company's financial performance and share price.

The benefits for workers are associated to the incentive to define their values and their fundamental rights at work (Celis, Bobadilla-Güémez, Alonso-Almeida, & Velasco-Balmaseda, 2017).

This leads to another competitive advantage related to the ability to attract and retain highly skilled, talented workers (Earle, 2003), culminating in increased protection and prevention which improves the workers' health and safety and, therefore, their quality of life (Hart, 2010).

Sustainability reports and Global Reporting Initiative (GRI) Standards

The ILO (2019) states that not only is it vital for companies to take joint action in adopting effective OHS data collection systems, but also to improve the use of OHS data for analysis and reporting.

According to GRI (2016), a sustainability report is "the practice of an organization to publicly disclose information about its economic, environmental and social impacts" (p. 3). CSR disclosure is voluntary but there are several legal requirements under Directive 2015/95/EU of the European Parliament, for the disclosure of non-financial information. For example, it is mandatory for companies with more than 500 employees to present an annual non-financial statement "containing information relating to at least environmental matters, social and employee-related matters, respect for human rights, anti-corruption and bribery matters.". This directive states that CSR, when properly structured, contributes decisively to increasing the trust of investors and consumers.

Among the methodologies companies employ to disclose this non-financial information and to report on CSR, the most widely used are the GRI Standards (Malan, 2017). In these standards, there are three series numbered 200, 300, and 400, which correspond, respectively, to economic, environmental, and social topics. The latter specific series includes GRI 403 which addresses OHS (GRI, 2018).

Its most recent version, GRI 403: OHS 2018 emphasizes hazard identification, risk assessment, health, and the OHS management system. The effective date of implementation was set to January 1, 2021, but early adoption by companies was encouraged when the Standards were published (GRI, 2018).

OHS Management Systems

Given its relevance in GRI 403: OHS 2018, it is essential to contextualize the concept of OHS management systems. These are part of the overall management system of an organization and are composed of guidelines that do not replace national and international laws and regulations (Pinto, 2017). The benefits of the disclosure, adoption and certification in these systems are improved working conditions, ensuring compliance with legislation, and improved internal communication about risks and hazards (Santos, Barros, Mendes, & Lopes, 2013), as well as the benefits derived from documenting and disclosing working conditions to interested parties.

The *Occupational Health and Safety Assessment Series* (OHSAS) 18001:2007 is the international reference and was updated by the ISO 45001: 2018 standard to optimize OHS

management. Both have in common the cycle rationale known as plan, do, check, and act. The organizations certified by the former had a period of 3 years to implement ISO 45001, whose deadline was March 2021 (Pinto, 2019).

OHS CONTENT ANALYSIS IN SUSTAINABILITY REPORTS

The literature regarding CSR focuses on issues related to environmental impact, while studies related to social issues are scarce. The lack of attention to OHS is problematic, given its influence on workers' quality of life and organizational performance. Fifka (2013) highlights a positive correlation between performance and disclosures, where companies with better social and environmental performance reveal they pay greater attention to disclosures. Similarly, Searcy, Dixon, and Neumann (2016) stress that OHS disclosure can be reflected in greater involvement of organizations towards effective OHS practices.

Studies on the quantity of information disclosed

Koskela (2014) analyzed 15 sustainability reports from three Finnish companies in the aeronautical, energy, and financial sectors for the period from 2007 to 2011. The author found that OHS disclosures accounted for about 10% of the total information. Regarding OHS, safety was highlighted in about 44% of the content, whereas well-being was the least disclosed, occupying about 22%, while the rest related to occupational health.

Searcy et al. (2016) analyzed 100 sustainability reports between 2011 and 2013. They found there was greater focus on indicator disclosures addressing regulated issues, such as safety, and a disregard of non-regulated issues, such as psychosocial dimensions. The study highlights the need for the disclosure of indicators that encompass the entire scope of OHS.

Evangelinou et al. (2018) analyzed, at the international level, the OHS disclosures in the sustainability reports of 40 companies in 2015. The results indicate that companies fall short in reporting quantitative data beyond injury and absenteeism rates. The authors highlighted OHS training programs as an inadequately analyzed indicator in quantitative terms. They concluded that although companies identify OHS as a material issue, this is not reflected in the disclosures.

Ruiz-Frutos, Pinos-Mora, Ortega-Moreno, and Gómez-Salgado (2019) analyzed 112 companies in Ecuador from different sectors. The authors collected information through 671 questionnaires between 2014 and 2015, having verified that more than 90% of the companies have OHS management systems. Around 51% of the companies stated that they have an adequate OHS management system. The authors concluded that the evaluation of the social aspects they disclosed points to their overestimation when compared to the evidence from audits to the OHS management system.

Studies on the quality of the information disclosed

The term quality of the disclosures is associated with principles such as comparability, accuracy, reliability, and relevance (Fernandez-Feijoo, Romero, & Ruiz, 2014b). Brammer and Pavelin (2008) emphasized that the quality of the disclosures translates into the transformation of stakeholders' knowledge about business strategy.

O'Neill, Flanagan, and Clarke (2016) reviewed annual reports from Australia's top 50 listed companies. The results indicated that companies in hazardous industries have higher disclosure rates. Additionally, the study verified the presence of strategic efforts to reduce the visibility of failures and thus mitigate investors' perception of occupational safety risk. The authors concluded that not only are OHS disclosures critical in the communication of the company's performance to investors but also that the regulation of disclosures improves their quality.

Fernandez-Feijoo et al. (2014b) argued that the information disclosed on OHS lacks a standard system of comparison. Tsalis, Stylianou, and Nikolaou (2018), to ease such a problem, based on GRI indicators in the G4 version, developed a four-point scoring system to assess the quality of OHS disclosures. The same authors, in a sample of 134 sustainability reports, for the years 2015 and 2016, concluded that the quality of OHS disclosures is poor and show that the factors influencing quality are the industrial sector, the continent where the company operates, and the certification in the OHS management system. They also concluded that the quality of OHS disclosures in Europe is higher than in North America and Oceania.

RESEARCH HYPOTHESES AND METHODOLOGY

The regional factor can lead to differences that impact on the quality of the CSR disclosures. These differences are related to the institutional and stakeholder theory that highlights the existence of regional and specific parameters that influence sustainability reporting practices (Brammer & Pavelin, 2004).

H1: The quality of OHS disclosures differs according to the region of Europe where the companies are located.

It is argued that larger enterprises have greater underlying exposure to the general public, and are more likely to consider CSR activities to strengthen their image (Brammer & Pavelin, 2008; Branco & Rodrigues, 2008). These enterprises are also considered to be associated with more inclusive social and environmental impacts as well as more resources to invest in non-financial disclosures than in the case of smaller companies (Lopes & Rodrigues, 2007).

H2: Small and medium enterprises (SMEs) tend to have lower quality OHS disclosures than larger companies.

The literature suggests that the sector in which the enterprises operate may be associated with the quality of their disclosures, highlighting the continuous pressure certain sectors are under to meet the expectations of their stakeholders, given the impact of their activity on society (Tsalis et al., 2018). This is associated with a positive impact on the quantity and quality of sustainability reporting disclosures (O'Neill et al., 2016). Cahaya, Porter, Tower, and Brown (2017) define high and low-risk sectors in terms of OHS. The authors emphasize that companies belonging to high-risk sectors have a higher tendency to suffer from illness and occupational accidents among their workers.

H3: Companies belonging to high-risk sectors tend to present higher quality in their OHS disclosures than low-risk ones.

Multinational companies operate in several countries with different political and legislative regimes, face more regulation, experience greater complexity in their organizational structure, and are more dependent on approval from stakeholders. Consequently, multinationals tend to provide more detailed information to meet the diversity of their stakeholders (Newson & Deegan, 2002). Cahaya et al. (2017) show that the tendency to disclose OHS information is explained by the fact that the company is multinational.

H4: Multinational companies tend to present higher quality in their OHS disclosures than those that are not multinationals.

The literature sustains that companies listed on the stock market have higher levels of CSR disclosure (e.g., Eng & Mak, 2003; Lopes & Rodrigues, 2007; Meek, Roberts, & Gray, 1995).

H5: Listed companies tend to present higher quality in their OHS disclosures than those that are not listed.

Determinants such as CSR certifications are considered credible and have an impact on mechanisms in the quality of disclosures (Fernandez-Feijoo, Romero, & Ruiz, 2014a). Monteiro and Guzmán (2010) suggest that an environmental certification can have a positive impact on, at least, the quality of disclosures related to this factor, leading Tsalis et al. (2018) to argue that companies awarded the OHSAS 18001 management system certification will have better quality OHS disclosures.

H6: Companies that have a certified OHS management system tend to present higher quality OHS disclosures than those that do not have a certification.

Another determinant that may impact on the quality of the disclosures is external assurance obtained in the reports (Tsalis et al., 2018). Furthermore, Fernandez-Feijoo, Romero, and Ruiz (2012) and Fonseca (2010) suggest that external assurance may have effects related to higher quality disclosures, and Fernandez-Feijoo et al. (2014b) associate this factor with more transparent, credible reports.

H7: Companies with external assurance in sustainability reports tend to have higher quality OHS disclosures.

Empirical model

The following model was developed to analyze the hypotheses, in line with studies such as Tsalis et al. (2018), Cahaya et al. (2017), and Brammer and Pavelin (2004).

$$QI_i = \beta_0 + \beta_1 SME_i + \beta_2 SECTOR_i + \beta_3 MULTINATIONAL_i + \beta_4 QUOTATION_i + \beta_5 OHS_MANAGEMENT_SYSTEM_i + \beta_6 EXTERNAL_ASSURANCE_i + \beta_7 X_i + \beta_8 ROA_i + \varepsilon_i \quad (1)$$

where: QI_i represents the quality index of the OHS disclosures of company i ; SME_i represents the small and medium size of company i ; $MULTINATIONAL_i$ represents the multinational character of company i ; $SECTOR_i$ represents the risk level of company i 's sector; $QUOTATION_i$ represents that company i is a publicly listed company on the stock market; $OHS_MANAGEMENT_SYSTEM_i$ represents the certification of company i 's OHS management system; $EXTERNAL_ASSURANCE_i$ represents the presence of external assurance in company i 's reports; Return on Assets (ROA_i) represents a control variable of company i 's profitability; X_i represents a set of dummy variables for company i 's region; ε_i is the term of random disturbance that is assumed to be independent and identically distributed.

The control variable ROA was collected from the Orbis database. Additional independent variables were collected from the official GRI database and from individual reports.

Dependent Variable

As presented in model (1), the dependent variable consists of an OHS quality index (QI) and is constructed using the quantitative content analysis method.

The analysis is based on the GRI 403: OHS 2018 standard. This standard list 10 indicators to be disclosed, presented in Exhibit 1, which will be used as a checklist for the QI.

Exhibit 1. GRI 403: OHS 2018

Management approach disclosures	
403-1	Occupational health and safety management system
403-2	Hazard identification, risk assessment, and incident investigation
403-3	Occupational health services
403-4	Worker participation, consultation, and communication on occupational health and safety
403-5	Worker training on occupational health and safety
403-6	Promotion of worker health
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships
Topic-specific disclosures	
403-8	Workers covered by an occupational health and safety management system
403-9	Work-related injuries
403-10	Work-related ill health

Source: (GRI, 2018).

In line with Tsalis et al. (2018), the quality of OHS information will be assessed through a four-point scoring system for each of the indicators. This procedure emphasizes the use of qualitative and quantitative data, as presented in Exhibit 2.

Exhibit 2. Four-point scoring system

Score	Quality of information	Description for the indicator under analysis
0	Non-existent	No relevant information mentioned
1	Low	Relevant qualitative information is mentioned
2	Fair	Relevant quantitative information is mentioned
3	Good	Relevant quantitative information is mentioned that could evaluate the progress of the indicator's performance

Source: (Tsalis et al., 2018, p. 318).

After identifying the scoring system and measuring the quality level of each category, the unweighted sum will be calculated, leading to the QI of the OHS disclosures.

$$QI = \sum_{i=1}^{10} GRI403_i \quad (2)$$

where: i is the number of OHS indicators disclosed. Thus, the total may be between 0 and 30.

Sample

The sample consists of companies present in the official GRI database at the time of its collection (February 2020), which met the following criteria: operate in Europe; the reports are for the year 2018; the OHS disclosures follow the most recent GRI 403: OHS 2018 standard. It was possible to filter the first two criteria and then proceed to the manual exclusion of all the companies whose disclosures followed previous versions of the GRI Standards regarding OHS. After these procedures, the final sample consisted of 101 companies from 19 EU countries.

Ramos and Patrício (2018) emphasize that OHS has attracted growing interest in Europe. In particular, the EU has implemented an OHS strategy encompassing analyses, trends, and implications on the national strategies of each Member State. Specifically, the geographical distribution of the sampled companies by region is detailed in Table 1, where 10% of the sample is in Central and Eastern Europe, 20% in Northern Europe, 39% in Southern Europe, and 32% in Western Europe. For each region, the countries are included as stipulated by EuroVoc.

Table 1. Countries of the sampled companies by regions of Europe

European Region	Country	Number of companies
Central and Eastern Europe	Croatia	2
	Czech Republic	1
	Hungary	3
	Poland	2
	Romania	2
Northern Europe	Denmark	3
	Finland	3
	Latvia	1
	Sweden	13
Southern Europe	Cyprus	1
	Spain	13
	Greece	4
	Italy	18
	Portugal	3
Western Europe	Austria	6
	Belgium y	5
	German	13
	France	3
	Netherlands	5

Source: Own elaboration.

Table 2 shows descriptive statistics of the sample variables.

Table 2. Descriptive statistics

Variable	Minimum	Maximum	Average	Standard Deviation
Dependent Variable				
Quality index (QI)	2.000	22.000	12.158	3.939
Continuous independent variable				
ROA (%)	-11.052	26.987	4.004	5.764
Dichotomous independent variable	Yes	No		
SECTOR	54%	46%		
OHS_MANAGEMENT_SYSTEM	57%	43%		
MULTINATIONAL	36%	64%		
QUOTATION	51%	49%		
SME	14%	86%		
EXTERNAL_ASSURANCE	56%	44%		

Source: Own elaboration.

RESULTS

Analysis of results regarding the quality of OHS disclosures

Table 3 presents the results from the OHS disclosures scoring, which will serve to answer the first research question.

Table 3. Score results for the type of information disclosed

Indicator	Mean	Reference to indicators (%)		Classification of the type of information disclosed (%)		
		Without reference (level 0)	With reference	Qualitative (level 1)	Quantitative (level 2)	Quantitative* (level 3)
403-1	1.069	20	80	56	20	4
403-2	0.961	20	80	64	15	1
403-3	0.980	26	74	52	19	3
403-4	1.098	19	81	51	30	0
403-5	1.470	9	91	44	38	10
403-6	1.284	11	89	52	33	4
403-7	0.745	31	69	64	4	1
403-8	0.814	51	49	17	30	2
403-9	2.500	9	91	2	17	72
403-10	1.118	53	47	4	19	24

Source: Own elaboration.

Except for the 403-8 and 403-10 indicators, each OHS indicator was referenced in most of the reports. Regarding 403-8, about 51% of the reports did not provide information on matters related to workers covered by the OHS management system. As for 403-10, the results indicated that 53% of companies avoided disclosing issues related to work-related ill health. We found that most of the companies reporting information on 403-1, 403-2, 403-3, 403-4, 403-6, and 403-7 disclosed this information mainly in a qualitative manner. It should also be noted that many companies who published quantitative information did not seem to do so in a way that may be comparable with other years.

Univariate analysis of the estimation results

First, to determine if the quality of the OHS disclosures is significantly different among the four regions of Europe, a one-way ANOVA test was conducted. At this stage, this analysis was intended to show that the variability observed in the QI could be exclusively explained by belonging to a specific region. The assumptions of normality and homogeneity of variances among the groups were verified through the Shapiro-Wilk and Levene tests.

Table 4. One-way ANOVA results

		F
Levene test for homogeneity of variances		0.699
ANOVA test of the effects between groups		2.800**
Multiple comparison (Tukey test)		Mean differences
Western Europe	Central and Eastern Europe	0.200
	Southern Europe	-2.436**
	Northern Europe	-1.200
Southern Europe	Central and Eastern Europe	2.636
	Northern Europe	1.236
Northern Europe	Central and Eastern Europe	1.400

* p-value \leq 0.10, the coefficient is significant at 10% or less;

** p-value \leq 0.05, the coefficient is significant at 5% or less;

*** p-value \leq 0.01, the coefficient is significant at 1% or less.

Source: Own elaboration.

For a 5% significance level, the findings showed that at least one of the population means was different from the others, implying significant and relevant differences in the quality of OHS disclosures among the four regions of Europe shown in Table 1.

Tukey's analysis revealed that the average differences were statistically significant only between the Western and Southern European regions, indicating that Southern European companies reported OHS indicators with a quality that was 2.436 points higher than Western European companies.

Validation of the multiple linear regression model assumptions

To comply with the assumptions of multiple linear regressions, diagnostic tests were undertaken before the analysis of the model estimation results. From the variance inflation factor (VIF) values, its maximum of 2.608 appeared to be lower than the deciding value of 10. Therefore, there was no multicollinearity.

To verify whether the variance of the errors was constant, finite, and positive, the White test was performed. Since the chi-square test statistic (statistic: 36.409; p-value: 0.133) was not significant at a 5% level, this meant the disturbance terms were homoscedastic.

Lastly, the Jarque-Bera test was performed, whose results (statistics: 0.224; p-value: 0.894) allowed us to conclude that the assumption of normality was verified.

Analysis of estimation results of model (1)

In the estimation results, the individual significance of the variables was given by the probability value, which was the p-value.

Table 5. Estimation results of model (1)

Variable	Regression coefficient
C	8.302 (7.605)***
OHS_MANAGEMENT_SYSTEM	3.223 (4.391)***
SME	1.578 (1.353)
SECTOR	0.860 (1.210)
MULTINATIONAL	0.531 (0.682)
QUOTATION	-0.333 (-0.419)
EXTERNAL_ASSURANCE	1.267 (1.708)*
ROA	-0.125 (-1.985)**
CENTRAL_EASTERN	0.731 (0.557)
NORTHERN	2.278 (2.177)**
SOUTHERN	1.859 (2.096)**
R squared	0.310
Adjusted R squared	0.233
F statistic	4.035***
Number	101

The numbers in brackets are the associated t-statistics. *, **, *** = p-value < 0.10; 0.05 and 0.01.

Source: Own elaboration.

The value of the F statistic suggested that the independent variables, when taken together, explained the total quality of the OHS disclosures.

The estimation results of model (1) were analyzed under the assumption *ceteris paribus* for all interpretations and adopting as the reference the significance level of 5%.

The variable of certification of the OHS management system was confirmed to be relevant in explaining the quality of the disclosures. On average, certified companies in this field presented higher quality OHS disclosures, being 3 points higher in quality than non-certified companies.

The variable related to the presence of external assurance in the reports also contributed significantly to explaining the dependent variable regarding the quality of OHS disclosures. This

meant that, on average, companies with external assurance in their reports presented higher quality OHS disclosures, approximately 1.5 points higher than those without external assurance.

The Northern European region variable was significant in explaining the quality of OHS disclosures, whose reports were on average 2.268 points higher in quality than Western European companies. The variable representative of the South European region was also significant, presenting OHS disclosures in this region that were 1.859 points higher in quality than Western European companies.

The variables SMEs, sector, multinational, quotation, and Central and Eastern European regions were not significant.

DISCUSSION

Quality level - Research question 1

Consistent with the literature, a greater emphasis on safety in the companies' disclosures such as indicator 403-9 was confirmed. According to Evangelinos et al. (2018) and Searcy et al. (2016), this may be justified because safety is a matter of stricter regulation. The results confirm that companies continue to show a lack of inclination to disclose quantitative data beyond safety indicators.

The lower quality and general disregard for the 403-10 indicator in comparison to the others is in line with Rushton (2017) and Searcy et al. (2016). These authors showed that non-regulated issues are underrepresented, such as occupational health and diseases. This result could reveal a more conspicuous difficulty in reporting occupational diseases than occupational accidents (Rushton, 2017).

As for 403-2 on hazard identification, risk assessment, and incident investigation, its lower quality could be interpreted in accordance with EU-OSHA (2019b), which has stated that about 80% of European companies have not carried out risk assessments because they believe they are well-known or because they assume there are no risks. According to the same source, such results may indicate a severe absence of awareness about the dangers of work, causing the lower quality of the disclosures regarding the 403-2 indicator.

In general, we found that the quality level of OHS disclosures per company was, on average, about 12 points out of 30.

Factors influencing the quality level - Research question 2

The following table presents the expected signs compared to those obtained and will be subsequently discussed.

Table 6. Expected vs. obtained signals

Variable	Expected signal	Obtained signal	Hypothesis confirmation
REGION	+	+	H1 confirmed
OHS_MANAGEMENT_SYSTEM	+	+	H2 confirmed
SME	-	+	H3 infirmed
SECTOR	+	+	H4 infirmed
MULTINATIONAL	+	+	H5 infirmed
QUOTATION	+	-	H6 infirmed
EXTERNAL_ASSURANCE	+	+	H7 confirmed
ROA	+/-	-	-

Source: Own elaboration.

By confirming Hypothesis 1, we concluded that there were relevant differences in the quality of OHS disclosures among the four European regions. The results in the univariate analysis suggested firms in Southern Europe presented higher quality OHS disclosures than firms in Western Europe. The estimation results supported the same outcome adding evidence of a positive impact in the Northern European region. Despite the lack of empirical evidence, this divergence among the regions regarding the quality of disclosures may be explained by findings from EU-OSHA (2019a) most recent survey of European enterprises and its European Survey of Enterprises on New and Emerging Risks (ESENER) database. This survey showed that the least supervised countries by the labor agency are in Western Europe, while the most controlled ones are located in Northern Europe. They also revealed that Western European companies considered legal obligations more complex and reported a higher lack of awareness among management and employees than the other three regions.

Hypothesis 2 was confirmed, supporting evidence consistent with Tsalis et al. (2018) that certification of an OHS management system contributes significantly to improving the quality of the information disclosed. This result contributes to theoretical robustness, strengthening the importance of having a certified OHS management system, whether OHSAS 18001 or ISO 45001.

In Hypothesis 3, the results of the simplified model and the signal obtained were contrary to the literature. These values may be conditioned by the small number of SMEs in the sample. According to Fernandez-Feijoo et al. (2014a), the effect of firm size on the quality of disclosures lacked theoretical support, given the scarcity of evaluations in this context. The signal value may indicate that the EU support provided to SMEs, such as those referred to by European Commission (2017b), have achieved results, allowing these companies to increase communication on OHS with stakeholders.

Hypothesis 4 was not confirmed and, contrary to what we expected, the company's sector risk concerning OHS did not seem to impact the quality of its disclosures. The signal found corroborated the literature, confirming that firms in a high-risk sector pay more attention to OHS disclosures (Cahaya et al., 2017; Roca & Searcy, 2012).

Hypothesis 5 confirmed that being a multinational company did not affect the quality of its OHS disclosures. Although contrary to the literature, this result is in line with Tsalis et al. (2018) and of Skouloudis, Jones, Malesios, and, Evangelinos (2014).

As for Hypothesis 6, the signal obtained showed a negative relationship, contradicting the literature. For Fernandez-Feijoo et al. (2014a), listed companies disclosed more CSR information but with less credibility. The authors argued that, as the main stakeholders of unlisted companies were not investors, there was a greater focus on the community and workers.

In Hypothesis 7, external assurance in reports proved to be significant. The positive relationship obtained corroborates the literature (Fernandez-Feijoo et al., 2012, 2014b; Fonseca, 2010). However, Tsalis et al. (2018) did not obtain significance in this factor. This result reinforces that having external assurance is a quality-enhancing factor, thus becoming an added value in the decision-making process of these companies.

The significance of the control variable of return on assets in explaining the quality of OHS disclosures is an additional contribution from this study. As in Branco and Rodrigues (2008), this variable was tested without any assumption as to the expected sign. Although the negative relationship between asset profitability and the OHS quality index is not a common conclusion, it corroborates O'Neill et al. (2016).

CONCLUSION

Occupational health and safety is a human rights concern with unsurpassed relevance in society and business. However, the issue has been widely disregarded (Malan, 2017), even though it has the potential to make companies more productive and sustainable.

This study contributes to the gaps in the OHS literature and the discussion on the business-society interface by linking OHS to social responsibility, human resources, economics, and management through a literature review and econometric applications. Several authors and international bodies have called for further research in this field and emphasize the need to provide reliable and comparable information. The European Parliament highlights the importance of companies disclosing non-financial social information that enables monitoring and performance management to measure the impact of business on society. This article also discusses current data on the quality of non-financial OHS disclosures by EU companies, identifying the determinants that affect these disclosures, which European regions are of lower quality, and which need more attention.

The results from the level of quality of OHS disclosures highlighted that there is still much room for improvement on the part of enterprises, as most of them refer to the information qualitatively and do not disclose work-related ill health (indicator 403-10). At the indicator level, the lowest quality indicator concerns prevention measures and the mitigation of negative OHS impacts (indicator 403-7), while the highest quality indicator concerns work-related injuries (indicator 403-9). These results suggest the need for more international attention on the development of materials and guidelines to help companies provide quality information that illustrates a complete picture of OHS performance to stakeholders.

The results confirm that the quality of OHS is positively influenced by factors such as the presence of an OHS management system, external assurance in sustainability reporting, and

the European region. The results add evidence to the literature that OHS disclosures are of higher quality in Northern Europe, followed by Southern Europe with almost the same level of quality. These findings indicate less attention to OHS issues in the Western European and Central and Eastern European regions, showing the need for greater focus from regulators and employers in those regions.

Management, including human resources management (HRM), may find these results helpful in making strategic decisions and providing clear signals of their commitment to OHS. These results are crucial, as quality disclosure provides knowledge to stakeholders who tend to put social and regulatory pressure on enterprises, creating a cycle of good practices with a positive impact on OHS.

The interpretation of the results is subject to some limitations. Only reports registered in the GRI database have been selected. Additionally, the analysis focuses on the latest GRI OHS standards, which limits the sample to only those companies that have applied the standards in advance.

This study is pioneering in the analysis of the level of quality of OHS disclosures and the factors influencing such quality in the European context. It is also innovative in the Portuguese case, providing an extensive literature review of the economic and CSR strands of OHS.

Future research could employ a similar methodology for the previous years and the period preceding the migration to the effective application of the GRI 403: OHS 2018 standard. An important contribution would be not only to expand the sample but also conduct analyses across different countries and continents. This quantitative analysis could be complemented with a qualitative one that investigates the possible factors causing the differences among regions or across sectors. In the same line, research on the degree of effective knowledge and awareness of managers and workers of the relevance of OHS would be a complementary contribution to map the main difficulties of companies in implementing and disseminating OHS.

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