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Evaluation of the occupational safety management system: literature review

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***Abstract*—** *Safety at work is a widely disseminated subject throughout the world, at various stages, regardless of the size of the organization because it is related to social responsibility and the well-being of employees and their families. The objective of the article is to carry out a literature review on the Workplace Safety System applied in the construction industry according to the Regulatory Norms. The methodology used was a systematic review of the literature in indexed databases: US National Library of Medicine National Institutes of Health Medical Literature Analysis and Retrieval System Online, Latin American and Caribbean Literature in Health Sciences and Scientific Eletronic Library Online and a Review of Regulatory Standards. It is noticed that it is possible to work in companies to identify and eliminate risks while protecting employees, since it is a legal requirement, considering the work safety management system as a strategy for increasing productivity and reducing costs. Occupational accident rates, absence and absenteeism rates. It is concluded that, the article shows that investing in health and safety management systems, reduce various types of costs and negative impacts generated by accidents, affecting not only the organization, but also the social life of employees and the environment , increasing productivity and the quality and efficiency of services. The manager needs to understand the dangers and risks and, together with the safety technician, mitigate them.*

I. INTRODUCTION

Safety at work is a widely disseminated subject One of the factors that increases the level of employee awareness is investing in safety. Conducting training in the field of work safety improves the relationship between the team and it is worth mentioning that the fact that an accident never occurred does not mean that it will never happen. The entire company, be it from any branch, must be involved in job security. The campaign on work safety should be aimed at all employees, management, administration and training should be used to standardize procedures, correct deviations and thereby prevent accidents at work [1].

throughout the world, at various stages, regardless of the size of the organization, as it is related to social responsibility and the well-being of employees and their families [2].

According to Miguel [3], in several workplaces the prevention of occupational risks is necessary, as well as the realization of risk maps with their own characteristics that contemplate an interrelation with the health security of employees regarding direct contact with biological, chemical, physical and ergonomic agents.

The statistics of the International Labor Organization (ILO) [4] places Brazil in 4th place in the ranking of work accidents in the world, with an average of 700 thousand records of work accidents per year, according to data from the Ministry of Labor. It has been known for a long time that civil construction is an activity that involves direct labor,

who use machines and equipment, are exposed to great risks, and can affect the physical integrity and health of workers.

However, if there is a Work Safety System in the companies, with programs, equipment and specifications that must be adopted to guarantee the physical and mental integrity of these works, the risks can be minimized. According to Silva [2], the civil construction sector is an activity that presents several risks, this since prehistory when men used energy sources and natural resources to cut down trees that they used to build bridges.

The research question that guided the development of this work was: what practices can be adopted to improve the characteristics of the work environment and minimize the risks and the occurrence of occupational accidents and diseases.

According to the International Labor Organization, the main causes of accidents are the deterioration of working conditions caused by globalization and the liberalization of markets, the disregard for workers' safety rights and the lack of compliance with the law or adequate safety regulations (ILO) [4].

Studies have shown that in more than 96% of accidents, risky behavior is the main cause. Risk behavior can be modified by identifying the causes and then correcting them. It is also necessary to pay attention to the quality, costs and values, and productivity that are achieved through these behavioral changes.

It is worth mentioning that a safe environment is one that supports individuals to work safely. These positive results in safety are obtained through actions and strategies applied in safety management in search of changing employees' behavioral habits. Safety in the workplace is important for the company's productivity and social responsibility.

Thus, it is essential for employees of the Personal Protective Equipment - PPE, device or product to protect against risks capable of threatening their safety and health. The use of this type of equipment can only be carried out when it is not possible to take measures to eliminate the risks of the environment in which the activity is developed.

The main authors searched in the literature were Chiavenato [5], Tavares [6], Reason and Hobbs [7], Cabeças e Paiva [8], Chu [1], Trivelato [9], Camisassa [10], Santos e Silva [11], Cicco [12], ILO [4] among others. The objective of the work is to carry out a literature review on the Workplace Safety System applied to the civil construction sector according to the Regulatory Norms.

II. METHODS

This is a systematic review of the literature in indexed databases: US National Library of Medicine National Institutes of Health (PubMed), Medical Literature Analysis and Retrieval System Online (MEDLINE), Latin American and Caribbean Literature in Health Sciences (LILACS) and Scientific Eletronic Library Online (SciELO) and CAPS and a Review of Regulatory Standards (NRs). The survey was conducted in the months of March and April 2021. For this survey, the controlled descriptors of the Virtual Health Library were used, consisting of “Occupational health”, “Accidents”, “Biosafety”, “Safety Management” and Risks obtained in consultation with Health Sciences Descriptors (DECS). The terms were used in the Portuguese language.

This review-included dissertations, theses, bibliographic reviews and case reports. As criteria for the selection, the articles were considered complete and available, in English and Portuguese, Control study, meta-analysis, and double blind. The period between 2015 and 2020 was delimited as a period.

As inclusion criteria, articles with full available text were selected, which addressed “Occupational health”, “Accidents”, “Biosafety”, “Safety Management” and “Risks”. Duplicate articles, those that did not contain the words “Biosafety”, “Safety Management” and Risks and whose outcomes did not address Occupational Safety, were excluded.

The studies were evaluated based on the title and summary by the authors, and after applying the inclusion and exclusion criteria, it was possible to select 15 articles to compose the sample. The articles were analyzed according to the relevance of the topic, the validity and precision of the results. After analysis, the studies were organized in a synoptic panel according to title, year of publication, objective, methods and results) in accordance with the NRS and in a descriptive order, their data were analyzed both qualitatively and quantitatively, where, from the data collection, they were grouped and analyzed from graphs and tables, generated by the Excel 2016 program, from the Microsoft Office package. Finally, articles of similar content are grouped.

III. RESULTS AND DISCUSSION

According to Chiavenato [5], the occupational safety system are technical, medical, educational and psychological standards used as accident prevention measures, with the purpose of eliminating unsafe conditions in the work environment. Also according to the author, “it is the set of activities related to preventing accidents and minimizing unsafe working conditions” [5].

Cabeças and Paiva [8], appeared with the first man, because whenever the human being performs some work, if one thinks about safety and with the passage of time the growth of the population, the need for a professional arose just to worry about the human security. Tavares [6], in the workplace safety management system in a company, the main areas are the administration and safety of work in the support and interaction of departments and employees with issues related to work safety

According to Reason and Hobbs [7], every work accident is one that occurs in the exercise of work, at the service of the company, and may cause bodily injury or functional disturbance, including death, loss or reduction of work capacity. Law requires occupational Safety and every company needs to comply with this determination in order to do so, increase the productivity and quality of its services and improve human relations in the work environment.

According to Tavares [6], it is the job safety manager's role to invest in employee safety, complying with current legislation and making the company's employees look after themselves and their service colleagues in relation to accidents, incidents and dangers, respecting especially safety laws and regulations.

Systematically, organizations with regard to Safety and Health at Work consider and seek to solidify in their activity a firm and concrete performance and above all, with quality. Therefore, they need efficient risk controls, especially of an occupational nature, in line with the policy and objectives of the Occupational Safety System - OSH.

On the other hand, Chu [1] points out that these policies cannot disregard the legal requirements of the country's development and growth aligned to population growth by the stakeholders in Safety and Health at Work. A Safety and Health at Work management system is a set of initiatives by the organization, focused on the safety and integrity of its employees and their activities in the production processes.

A Management System for Safety and Health at Work - SGSST must be managed in compliance with the policies, requirements and laws applicable to safety issues, according to the configuration of each organization.

Trivelato [9] defines actions and policies designed to prevent accidents and occupational diseases as a safety policy and program. The implementation of these policies is foreseen in the legislation of most developed and developing countries, considering the elements recommended by the legislation applicable in the company. Regarding the culture of safety and health at work, Fig. 1 demonstrates what is necessary for it to happen.

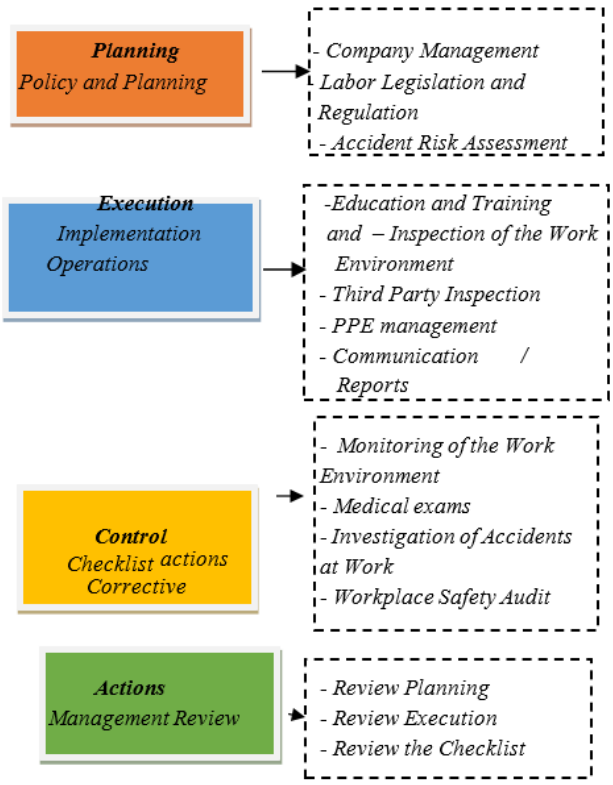


Fig. 1 - Guidelines for promoting the Culture of Safety and Health at Work

Source: adapted from Brazil [13]

Chu [1] points out that company are different from each other; therefore, the policies implemented for one organization do not necessarily meet the needs of another. It is worth remembering that the principles inherent in the management of risks to the health and safety of workers are independent of the organization of the company.

According to Camisassa [10], for the management of risks to the health and safety of employees, there are some independent and general principles for each type of company. It is worth mentioning that a systematic approach at all levels of occupational safety management is essential.

According to Santos and Silva [11], the occupational safety manager integrates into the strategic plans and management processes, documents recommended in the safety standards such as the identification of risks, analysis and evaluation of these risks, forms of control implemented; ways of reviewing programs and employee participation in improving the organization's competencies inherent in risk control.

According to the occupational health and safety policy, it is necessary to follow some principles, they are:

a) Be appropriate according to the nature of its activities, the size of the company, always

assessing the protection of workers, employees, contractors and visitors;

b) Always present the acceptance of the company's top management. This acceptance needs to be properly pointed out, documented, and made available to all employees and interested elements when applicable;

c) Always accept the relevant legal conditions, collective agreements, applicable to its activities;

d) Continuously guarantee the knowledge of workers or their legal representatives in OHS activities;

e) To contemplate the commitment to OSH of all, especially the top management, of the continuous improvement in the prevention of accidents, diseases and incidents related to work, always aiming at the reduction of the situations that may cause damage to the physical and

mental integrity of the workers [13]

For Chu [1], risk management needs to be implemented at the center of the strategic management of any company, being a process where companies deal with the risks inherent in their activities. The application of management guidelines, through principles of health, hygiene and safety, accepts the identification of hazards, estimation and control of risks relevant to the process, in order to prevent the occurrence of accidents.

Cabeças, Paiva [8] emphasize that the methods of analysis and assessment of occupational risks are fundamental for the development of measures to control occupational risks. In control measures, the important thing is to be aligned with the dangers and risks so that the occurrence of these damages can be prevented. It is assumed that this alignment is effective in terms of the knowledge of the individual damages associated with the exposure of hazards and risks.

In the articles analyzed, Salamone [14], Shi et al.,[15] highlight the main motivations and obstacles in the implementation of Occupational Health and Safety Management Systems (SGSST) based on the OHSAS

18001 standard, as described in the table below.

Table 1: Main motivations and obstacles in the implementation of OHSMSs

Motivations	Obstacles
Image improvement	*Very high cost*
Lower costs	*Lack of information*
Continuous improvement	*Management difficulties*
New opportunities in the market	*Lack of standard clarity*
Better productivity	*Lack of financial resources*
Greater competitiveness	*Lack of competent human resources*
Pressure from customers	
Government pressures	
Product improvements	
Pressure from the local community	

Source: *adapted from Salamone [14], and Shi et al., [15]*

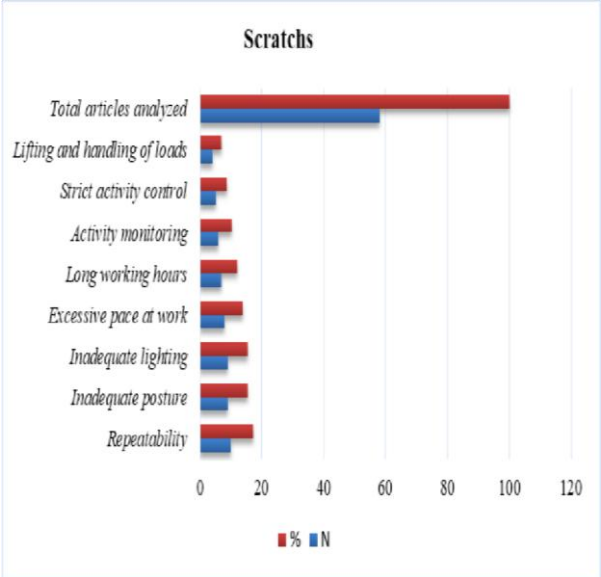
In Garrigou et al., [16] the main occupational health and safety practices were highlighted, such as: commitment of the management, they must be aware of the importance of OSH and adapt the environment to safe working conditions. Shi et al., [15] highlights occupational health and safety programs, with a risk map prepared by the Internal Commission for Accident Prevention in order to carry out a survey of the risk areas.

For Salamone [14], internal communication is one of the main occupational health and safety practices, as it defines how the organization can carry out communications through panels, banners, among other ways to inform employees. In Chu's view [1], the program for the integration of new employees, through guidance on measures to prevent accidents and occupational diseases, is one of the main safety practices.

From the point of view of Camisassa [10], preventive measures with individual prevention equipment and the involvement of the Human Resources area in training and leadership programs with the objective of improving SGSST.

In the 15 articles analyzed, the main cited ergonomic risks found in companies are:

Graph 1 - Ergonomic risks found in the analyzed articles



Source: *Elaborated by the author (2021)*

According to the 16 articles analyzed, repetition appeared in 10 (17.2%) of the articles, inadequate posture and inadequate lighting in 9 (15.5), excessive work pace in 8 (13.8%), Workdays prolonged in 7 (12.0%), monitoring of activities in 6 (10.3%), strict control of activities in 5 (8.7%) and lifting and handling of loads in 4 (7.0%). It is justified that in the total that appears in the graph of 58 articles despite having been analyzed 16 articles because risks appear in more than one article.

It is noticed that it is possible to work in companies to identify and eliminate risks while protecting employees, since it is a legal requirement, considering the work safety management system as a strategy for increasing productivity and reducing costs. Occupational accident rates, absence and absenteeism rates.

IV. CONCLUSIONS

Over the years, the health and safety of workers has led to regulatory standards for employees to perform their duties safely. In this way, occupational health and safety management systems seek to adjust the workplace to the employee in order to comply with current regulations, providing a sense of well-being and maintaining or improving their productivity and efficiency.

The lack of an occupational health and safety management system generates several disorders to the institution, such as taking an employee to suffer temporary or permanent injuries, which can affect the workplace in the event of an accident and thus generate losses for the company. Company, but to all interested parties, with the loss of productivity, I damage the image of the company and financial.

The main causes of accidents pointed out in the articles are negligence, lack of training, inadequate jobs, lack of attention, but with work, management and safety due to costs and lack of incentives can be minimized if these standards were implemented in companies. With the application of SGSST, accidents can be minimized within the company, as well as the dissemination of knowledge through training.

The article shows that investing in occupational health and safety management systems reduces various types of costs and negative impacts generated by accidents, affecting not only the organization, but also the social life of employees and the environment, increasing productivity and quality and efficiency of services. The manager needs to understand the dangers and risks and, together with the safety technician, mitigate them.

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