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Study of Safety Culture in Public Universities: A Case Study at the Federal University of Bahia

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The maturity of safety culture in academic environments has gained relevance due to the complexity of university routines, which range from laboratory and clinical practices to field, administrative, and pedagogical activities. In public institutions, these challenges are intensified by the diversity of profiles and structural limitations. Thus, understanding the maturity stage of the safety culture allows for the identification of weaknesses, attitudes, and behaviors that influence the institutional environment. Therefore, this study seeks to identify the level of maturity of the safety culture at the Federal University of Bahia, analyze the perception of different groups within the university community, and point out strategic paths for strengthening a preventive and participatory culture. The research used a mixed approach, integrating interviews with managers and technical staff and questionnaires applied to the university community, which enabled a comprehensive assessment of practices and perceptions of occupational safety. The interviews revealed structural weaknesses, such as managerial ignorance about OSH, lack of systematic communication, absence of standardized procedures, and a predominance of reactive actions. Underreporting, difficulties in monitoring actions, and insufficient training were also observed. The community's perception confirmed these challenges, highlighting problems with communication, participation, involvement, and environmental conditions. The dimensions evaluated suggest that the maturity of the safety culture at UFBA lies between the reactive and bureaucratic stages, with occasional advances, but without strong integration between management, institutional processes, and everyday practices. It is concluded that the university needs to move towards a more strategic and proactive OSH management model, strengthening communication, senior management commitment, and community participation. The study offers a comprehensive diagnosis and indicates ways to develop a more mature and sustainable safety culture in the university environment.

Keywords: Safety culture; Organizational maturity; Workplace safety.

1. Introduction

Public universities are highly complex organisations in terms of structure and operations, bringing together diverse work environments such as laboratories, university hospitals, workshops, administrative departments and field activities. This diversity increases exposure to occupational risks and poses significant challenges for occupational health and safety (OHS) management.

The literature points out that accident prevention does not depend exclusively on regulatory compliance or technical controls, but above all on the development of a safety culture capable of influencing perceptions, behaviours, and decision-making processes (Reason, 1997; Guldenmund, 2010). In this context, safety culture maturity models allow us to understand how organisations evolve from reactive approaches to more proactive and integrated practices (Westrum, 2004; Hudson, 2007).

Despite their relevance, empirical studies on safety culture in public universities are still scarce, especially in the Brazilian context. Thus, this study aims to assess the level of maturity of the occupational safety culture at the Federal University of Bahia (UFBA), integrating quantitative and qualitative data to offer a comprehensive institutional diagnosis.

2. Theoretical Framework

2.1.*Safety culture and maturity models*

Safety culture can be defined as the set of shared values, beliefs, attitudes, and practices that guide how safety is perceived and managed in an organisation (Reason, 1997). Westrum (2004) proposed a cultural typology based on the flow of safety-related information, distinguishing between pathological, reactive, calculative, proactive, and generative cultures.

Hudson (2007) further developed this approach by describing the maturity of safety culture as an evolutionary process. In reactive cultures, safety is prioritised only after accidents occur; in calculative cultures, formal control systems and indicators emerge; in proactive and generative cultures, safety is incorporated as a strategic value and organisational principle.

2.2.*Assessment and management of safety culture*

Several instruments have been developed to assess safety culture, such as NOSACQ-50 (Kines et al., 2011). In the Brazilian context, the model proposed by Gonçalves Filho et al. (2011) stands out, integrating five essential factors for assessing the maturity of a safety culture: information, organisational learning, involvement, communication, and commitment.

The information factor relates to the recording and use of data on accidents and risks, while organisational learning refers to the ability to transform this information into preventive actions. Involvement expresses the participation of organisational actors in safety decisions, communication concerns the clarity and effectiveness of information flows, and institutional commitment reflects the priority given to OSH by senior management. High levels of these factors characterise more mature and preventive safety cultures (Hudson, 2001; Gonçalves Filho et al., 2011).

This model constitutes the main methodological basis of the present study, guiding both the construction of the instrument and the interpretation of the results.

2.3.*Stages of maturity of safety culture*

The interpretation of the results of this study is based on the stages of maturity of safety culture described by Gonçalves Filho et al. (2011) and Hudson (2001), which represent an evolutionary process of organisational development in relation to occupational safety:

- Pathologic: safety is neglected and seen as an obstacle to production; accidents are attributed exclusively to workers.
- Reactive: the organisation reacts to accidents after they occur; safety is treated as a priority only in critical situations.
- Bureaucratic (or calculative): there are formal systems, standards and safety procedures, but with a predominant focus on legal compliance and indicators, without full integration into management.
- Productive (or proactive): the organisation anticipates risks, invests in prevention and actively involves workers in safety decisions.
- Sustainable (or generative): safety is a core organisational value, embedded in culture, strategies and routines, and continuously improved.

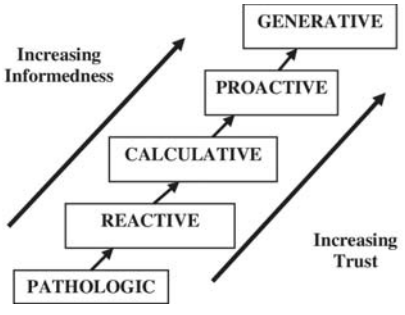

Fig. 1. Safety Culture Model of Hudson (2001).

These stages should not be understood as rigid categories, but as analytical references that allow the organisation to be positioned on a continuum of cultural maturity. In the present study, this typology was used as an interpretative basis for classifying the safety culture at UFBA.

2.4. *Safety culture in public universities*

Public higher education institutions present specific challenges for OSH management, including fragmented administrative structures, autonomy of academic units, and budgetary constraints. These factors often result in safety practices that depend on

individual initiative, hindering the consolidation of mature and systematic safety cultures (Cooper, 2000; Gonçalves Filho et al., 2011; Guldenmund, 2010).

3. Methodology

3.1.*Research design*

This is an applied, exploratory, and descriptive research study using a mixed-methods approach, structured as a single case study. Methodological triangulation was adopted to increase analytical robustness and reduce biases associated with single data sources (Carriço et al., 2015; Yin, 2018).

3.2.*Context and participants*

The research was conducted at the Federal University of Bahia (UFBA). The following participated in the study:

- 91 questionnaire respondents (students, lecturers, and administrative staff);
- four directors of academic units;
- the technical manager responsible for occupational safety at the institution.

3.3.*Data collection instruments*

The questionnaire used was validated and adapted from the model developed by Gonçalves Filho et al. (2011), covering the following dimensions: information, organisational learning, involvement, communication, and commitment.

The semi-structured interviews addressed aspects related to information management, documentation and legal compliance, organisational learning, community involvement, communication and institutional commitment to OSH.

3.4.*Data analysis procedures*

The quantitative data were analysed using descriptive statistics. For each item and dimension, the arithmetic mean was calculated according to Eq. (1):

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i \quad (1)$$

where $\bar{x}$ represents the average of the responses, x_i corresponds to the value assigned by each respondent, and n is the total number of participants.

4. Results

4.1.*General characterisation of the safety culture*

Integrated analysis of the data reveals that the occupational safety culture at UFBA is at an incipient to intermediate level of maturity. There is a strong individual appreciation of safety, contrasting with institutional weaknesses in management, communication and prevention.

4.2.*Importance attributed to occupational safety*

The item with the highest average score in the questionnaire was: “I consider it important for the university to offer workplace safety training” (average = 4.76). This result indicates a high degree of awareness and symbolic value placed on safety by the university community, suggesting that the main limitations do not lie in a lack of individual interest, but in the absence of systematic institutional actions.

4.3.*Individual responsibility and risk communication*

Respondents stated that they felt responsible for contributing to safety (mean = 3.62), but reported feeling less comfortable communicating unsafe situations (mean = 3.04). The interviews confirmed the lack of formal reporting channels, which encourages underreporting of incidents and reinforces reactive practices.

4.4.*Communication, participation, and training*

The dimensions related to communication and participation had the lowest averages, highlighting the lack of a clear channel for reporting problems (average = 1.79) and low community participation in safety decisions (average = 1.89). Furthermore, participation in formal training was limited (mean = 1.89), as was the perception of preparedness for emergencies (mean = 2.01).

4.5.*Experience of accidents and physical conditions*

Approximately 27.5% of respondents reported having witnessed or suffered accidents or risky situations at UFBA, highlighting the presence of real risks in everyday institutional life. The perception of physical conditions, equipment, and signage also presented intermediate averages, reinforcing the fragility of the preventive infrastructure.

5. Discussion

The convergence between quantitative and qualitative data allows UFBA to be characterised as having a predominantly reactive safety culture, with isolated calculative elements. Although technical reports, accident investigations and specialised teams exist, these mechanisms are not integrated into a robust preventive system.

According to Hudson's model (2007), this pattern reflects organisations that prioritise corrective actions after adverse events, to the detriment of systematic risk anticipation strategies. This finding is consistent with studies on public organisations, in which institutional fragmentation and limited communication hinder progress towards higher levels of cultural maturity (Cooper, 2000; Gonçalves Filho et al., 2015; Guldenmund, 2010).

6. Conclusions

This study assessed the maturity of the occupational safety culture at UFBA using methodological triangulation. The results indicate an incipient to intermediate level of maturity, predominantly reactive, marked by high individual awareness and significant institutional weaknesses.

The findings suggest that UFBA has the technical and human resources to evolve towards a more proactive safety culture, provided that it strengthens its communication channels, institutionalises organisational learning processes, expands training programmes, and strategically integrates OSH into institutional planning.

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