

Research Paper

The Safety Culture Among the Employees of the Operational Units of South Zagros Oil & Gas Production Company, Iran



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ABSTRACT

Background: Safety plays a significant role in the oil & gas industries, where there are many risk factors that can cause accidents. This study aims to evaluate the level of safety culture among the employees of the operational units of South Zagros Oil & Gas Production Company (SZOGPC).

Materials and Methods: In this descriptive-analytical study, a standardized safety culture questionnaire with 50 items and five domains of education, workplace, safety priority, information exchange, and management commitment was used. All employees in the operational units of the SZOGPC were selected as samples (n=260). They answered the questions based on Five-point Likert scales. After collecting the data, they were entered into SPSS software, v. 23.

Results: The mean safety culture score in Parsian operational unit was higher than in other operational units. The lowest level of safety culture was related to the operational unit of Sarkhun & South Gashu. The Mean±SD of total safety culture score was 19.03±0.248. Among the safety culture domains, safety priority had the highest score, while the workplace had the lowest score.

Conclusion: The safety culture among the employees of the operational units of the SZOGPC is at moderate level. The managers of this company should improve the safety culture among their employees; a positive and high safety culture among employees can facilitate the organization's movement to achieve higher safety standards.

Keywords:

Accidents, Safety, Safety culture

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1. Introduction

The workforce of any country, especially developing countries, is an important source of the national capital and one of the foundations of economic and social development. Therefore, protecting the health of the workforce and improving the workplace are very important. Millions of people die or are disabled every year due to accidents at work. The people working in industrial environments are exposed to more extreme conditions and injuries, which is increasing with the growth of technology [1]. Despite all the efforts that have been made to improve safety in industrial environments and reduce accidents, the human role in the occurrence of accidents has not been reduced [2]. Employees act as a team in the organization and are influenced by the organizational culture [2]. According to the International Labor Organization, the most important safety principle in the workplace is to pay attention to the cultural, social, or biological aspects [3]. In a system, the background and cultural context affect the safety of work conditions. Therefore, today there is a category called safety culture [4].

Nowadays, most accidents are due to human error and carelessness. Therefore, one of the effective steps to reduce occupational accidents is to increase the safety culture among the employees [5]. It has been proven that one of the ways to reduce accidents is to promote the safety culture [6]. The importance of safety is determined when all employees know the consequences of non-compliance with safety regulations and that they are responsible for protecting their own health the health of colleagues. Unfortunately, in some cases, the safety laws have been misunderstood; some believe that these laws are barriers to work, while for others these laws can protect the employees and the company [7].

The most important characteristics of a positive safety culture are visible management, good communication between employees and managers, employee participation in decisions related to safety and health, and management commitment to the safety [8]. The UK nuclear safety committee defines safety culture as “the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to an organization’s safety and safety management” [9]. Mand defines safety culture as an aspect of organizational culture that influence attitudes and behaviors that reduce or increase risks [10]. The common point in many definitions of safety culture is that the concept is related to employee’s values, beliefs,

thoughts, and behaviors about the safety [8]. There is a similar concept called “safety climate”. Safety climate is the shared definition of safety culture that directly measures the perceptions and behavior of employees. A safety climate is a set of policies, procedures, and rewards related to safety issues that employees perceive. In fact, the safety climate describes the personal perceptions of the workplace safety values [11].

One the cases that caused a major change in safety culture was the Chernobyl accident in Ukraine. Before this accident, industries were trying to reduce the number of accidents by emphasizing appropriate protections, personal protective equipment, training, reward-punishment systems, issuing instructions, and establishing safety management systems. However, the Chernobyl accident showed that in order to prevent accidents, it is not enough to take these measures and force employees to follow the regulations; there is a need to have internal commitment to safety and show safety behaviors; i.e., safety culture, which guarantees the effectiveness and success of the preventive measures [11]. Experts believe that safety, instead of only being objective and practical, is a mental phenomenon that needs to be embedded in the minds of people; this means that safety cannot be taken for granted, and safety has been integrated with life [12].

Paying attention to safety and health issues such as safety culture in the organization has not only reduced the risk of accidents but also has had economic and financial benefits, which shows the long-term return of capital to the organization [13]. If the safety in organizations be institutionalized based on employees’ culture and behavior, it can be ensured that it is continuous and durable [14]. An organization can claim that its efforts to organize and institutionalize safety are effective when no pressure is imposed on employees to implement safety instructions [15]. In organizations where safety is stable and durable, employees are not encouraged to have safe actions and are not reprimanded for neglecting the safety laws. In these organizations, working in a safe way is a part of culture and is an obvious matter [10].

Considering the importance of safety culture in industries, especially oil and gas industries, this study aims to investigate the level of safety culture in the operational areas of South Zagros Oil & Gas Production Co (SZOG-PC) as one of the largest oil companies in the South Zagros area. This company has not yet been monitored in terms of safety culture, and this study is an attempt to fill this research gap. It is one of the three companies affiliated to the Iranian Central Oil Fields Company (ICOFC),

Table 1. Mean scores of safety culture domains for the operational units of SZOGPC

Operational Unit	Safety Priority	Information Exchange	Education	Workplace	Management Commitment	Total
Nar & Kangan	64.3	28.3	21.3	14.2	21.3	09.3
Agar & Dalan	61.3	26.3	22.2	13.3	14.2	87.2
Parsian	71.3	87.2	01.4	24.3	16.3	39.3
South Sarkhun & Gashu	12.3	15.3	02.3	98.2	2	85.2
Sarvestan & Saadat Abad	15.3	14.3	07.3	24.2	9.3	10.3

which supplies a part of the country’s gas consumption. Currently, this company manages five operational areas: Nar & Kangan, Aghar & Dalan, Parsian, Sarkhun & South Gashu, and Sarvestan & Saadat Abad in Fars, Bushehr, and Hormozgan provinces of Iran.

2. Materials and Methods

This descriptive and cross-sectional study was conducted in 2019. The study population consists of all employees working in SZOGPC’s operational units. The sample size was determined 260 using Cochran’s formula. Sampling was done using stratified random sampling method equally from the operational units. The data collection tool was a demographic form and a researcher-made safety culture questionnaire. This questionnaire has 50 items related to 5 areas of education, workplace, safety priority, information exchange, and management commitment, each with 10 items. It was designed based on the literature and visiting the study environment. and. The scoring is based on a five-point Likert scale from 1 to 5; the respondents express their opinions in a scale as completely agree, agree, no idea, disagree, and completely disagree. Finally, the sum of the scores of all domains is determined as the total score. The content va-

lidity of this questionnaire was determined based on the opinions of laboratory and safety experts. The reliability was determined by calculating the Cronbach’s alpha coefficient, which was obtained 0.87. After collecting the data, they were entered into SPSS software, version 23. The Mean±SD were used for describing demographic information and safety culture scores. In this study, the authors observed all ethical principles, which were in accordance to the Declaration of Helsinki.

3. Results

Considering that the study was conducted in operational units of the industrial company, all 260 participants were male. Their Mean±SD age was 29±3.32 years, and their mean work experience was 9±1.021. In terms of education, 40 (15.3%) had a diploma or lower, 162 (67.5%) had a bachelor’s degree, and 58 (24.1%) had a master’s degree or higher. The employees’ mean scores of safety culture based on five domains are shown in Table 1. The mean score of safety culture in the Parsian operational unit was higher than in other operational units of SZOGPC. The lowest safety culture score was related to the Sarkhun & South Gashu unit. Based on the safety culture domains, the highest score was related to

Table 2. Mean scores of the safety culture domains for the employees working in the operational units of the SZOGPC

Variables	Safety Culture Component	Mean±SD
Nar & Kangan	Safety priority	3.44±0.248
Agar & Dalan	Information exchange	3.14±0.632
Parsian	Education	3.10±0.513
South Sarkhun & Gashu	Management commitment	2.88±0.781
Sarvestan & Saadat Abad	Workplace	2.74±0.812
Total		19.03±0.395

the training domain in the Parsian unit, and the lowest score was related to the management commitment domain in the Sarkhun & South Gashu unit.

Table 2 shows the safety culture mean scores of participants. The mean total safety culture score of participants was 19.03 ± 0.248 , indicating the moderate level of safety culture among the employees. The safety priority domain had the highest score, while the workplace domain had the lowest score.

4. Discussion

To reduce the number of accidents in the workplace, create a safe environment and, as a result, reduce the cost burden, increase productivity, and most importantly, protect the workforce, a preventive approach should be taken into account for achieving safety. Safety culture is one of the important concepts that can help managers in this field. This study investigated the level of safety culture in the operational units of SZOGPC. The results showed that their safety culture was at a moderate level. This indicates the potential to increase the safety culture among employees and reduce accidents.

In the study by Shekari et al. [16], who investigated the level of safety culture in a petrochemical company, the level of safety culture was positive and moderate, which is consistent with the results of the present study. Youn et al. reported the level of safety culture in the Chinese oil industry as favorable [7]. Haghighi et al. estimated the level of safety culture in an oil refinery factory in Iran as moderate [17]. Ebrahimi et al. reported the level of safety culture in one of oil companies in the South Pars area in Iran as moderate and showed that with educational intervention, the safety culture among employees can be increased [18]. The safety status and safety culture were also found moderate in the study of Khandan et al. on the industries of Qom province [19]. Danielsson et al. evaluated the safety culture among the employees of Swedish hospitals, and the results showed that the safety culture was at a good situation [11]. Poursadeghiyan et al. reported the safety culture among nurses working in hospitals of Zabol University of Medical Sciences as favorable [20].

The results of our study showed that in all operational units, the safety priority score was moderate to high, and it had the highest score compared to other safety culture domains. This indicates that employees prioritize safety in their workplace and care about their own health and the health of colleagues. In examining the safety culture in hazard industries of Netherlands, Gerrard et al.

considered the safety priority more important than other priorities. They believed that employees and managers should pay more attention to the safety [8]. The results of our study showed that the employees in the operational units of the SZOGPC had the lowest score in the workplace domain of safety culture. Hence, it seems that their workplace does not provide the necessary safety for them. This should be solved by developing tools, procedures, and protective devices. In Ebrahimi et al.'s study, the workplace domain also had a low score [18], which is consistent with the present study. In the studies by Sherman et al. and Shingai, the workplace safety had a high score [13, 21]. By comparing national and international studies, it can be found that industries in developed countries provide a safer workplace.

The limitations of the present study were the high distance between the operational units and the difficulty accessing employees due to work shifts. For future study, it is suggested that the safety culture be evaluated before and after an educational intervention. Furthermore, the impact of the education on the safety culture components should be measured.

5. Conclusion

Overall, it can be concluded that the safety culture of the employees in operational units of the SZOGPC is at a moderate level. Among the safety culture domains, safety priority is more considered by these operational units while their workplace safety is poor.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article. The participants were informed of the purpose of the research and its implementation stages.

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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