Safety Management in a Relationship-Oriented Culture

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A relationship-oriented culture predominates in the Greater China region, where it is more important than in Western countries. Some characteristics of this culture influence strongly the organizational structure and interactions among members in an organization. This study aimed to explore the possible influence of relationships on safety management in relationship-oriented cultures. We hypothesized that organizational factors (management involvement and harmonious relationships) within a relationship-oriented culture would influence supervisory work (ongoing monitoring and task instructions), the reporting system (selective reporting), and teamwork (team communication and co-ordination) in safety management at a group level, which would in turn influence individual reliance complacency, risk awareness, and practices. We distributed a safety climate questionnaire to the employees of Taiwanese high-risk industries. The results of structural equation modeling supported the hypothesis. This article also discusses the findings and implications for safety improvement in countries with a relationship-oriented culture.

safety management   safety climate   relationship-oriented culture
high-risk industry   safety culture

1. INTRODUCTION

The investigations of several major industrial disasters in the 1980s revealed that the root causes involved more than technical or human failures [1, 2]. Since the 1980s, researchers have recognized organizational factors as an important cause of failures in large-scale complex systems [2]. Previous studies related to safety climate have also found that organizational factors were linked to accidents, incidents, and injuries [3, 4, 5, 6, 7]. For example, high-quality leader–member exchange and management support contributed to improved safety communication and safety commitment, which in turn reduced the incidence of accidents in the workplace [8]. Kelloway, Mullen, and Francis found that safety-specific transformational leadership had indirect impact on reduction of safety-related events and injuries [9]. Because of their importance to safety, the impact of organizational factors on safety performance has become an essential topic in safety management [2].

Hofstede found that the characteristics of a culture could have a great influence on employees' attitudes and behavior [10]. With an increased number of foreign-operated factories overseas, the influence of cultural characteristics on workplace safety is becoming an increasingly important management issue. With the rapid growth of emerging Chinese Asian markets recently, the research in this region has received more attention. An important aspect in Chinese culture is the

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concept of *relationship-oriented*, which refers to the implicit mutual interest and benefit that one has developed in one's social connections [11]. A relationship orientation is traditionally more important in most countries in the Greater China region than in Western countries [12, 13].

The relationship-oriented culture emphasizes public morality and group discipline [12, 13, 14, 15]. It is traditionally collectivist [10, 14, 16] with a paternalistic leadership style [17, 18]. People in relationship-oriented cultures highly value dignity (face), order, and harmony [15, 17, 18, 19]. In a relationship-oriented culture a high priority is placed on maintaining hierarchical order with superiors, loyalty to organizations, and harmonious working relationships within organizations [12, 14, 18, 19, 20]. The communication style is usually indirect and context-dependent [21]. Those features strongly influence organizational structure and interaction among members in an organization [18, 19, 22].

Merritt and Helmreich [23], Von Thaden, Li, Li, et al. [24], and Hsu, Lee, Wu, et al. [25] suggested that some aspects of safety management differed between a relationship-oriented culture and Western cultures. Merritt and Helmreich, while conducting a cross-cultural survey investigating the safety attitudes and behaviors of Asian and Western pilots, found there was a belief that superiors were the ones to take control in emergency situations, and subordinates should follow without question. They also found most Asian pilots to be collectivists, less willing to stand out in a crowd and less likely to voice opposing opinions in meetings. Von Thaden et al., who conducted a study of safety climate in Chinese airlines, found that the pilots of Chinese airline companies scored lower on accountability, employee empowerment, and active reporting. Hsu et al. found that safety climates in oil refinery plants in Taiwan and Japan differed in several aspects. Taiwanese upper management, as more directive, were more involved in safety promotion than their counterparts in Japan. Contrary to the generally proactive approach found in Japanese firms, Taiwanese workers tended to be more reactive. The Taiwanese were more focused on interpersonal relationships and placed greater emphasis on a harmonious work atmosphere than the Japanese.

From a Western perspective on safety, some characteristics of relationship-oriented cultures discussed in those studies may not be adapted to safety operation in large, complex systems. Nevertheless, prior research did not focus on the way those organizational factors in a relationship-oriented culture might influence safety performance in safety management. Therefore, this study aimed to investigate the possible influence mechanisms of safety management in relationship-oriented cultures. We first characterized the organizational factors affecting organizational safety in relationship-oriented cultures. Then, we proposed and examined a structural model of relationship-oriented safety management including organizational factors and safety performance. Finally, we discussed potential practical implications for safety improvement.

2. DEVELOPING A SAFETY MANAGEMENT MODEL IN A RELATIONSHIP-RELATED CULTURE

To develop a safety management model, this study assumed that group factors mediated the influence of organizational level factors on individual safety behavior [26, 27]. We selected two organizational factors of safety climate characteristic for a relationship-oriented culture, including management involvement and harmonious relationships. Work group factors included supervisory practices (task instructions and ongoing monitoring), a reporting system (selective reporting), and teamwork (communication and co-ordination). Individual factors were reliance complacency, risk awareness, and safety behavior. Figure 1 illustrates those relationships. The following sections describe the specific hypotheses of the model.

2.1. Management Involvement and Safety Performance

Previous studies on organizational safety climate suggested that management involvement
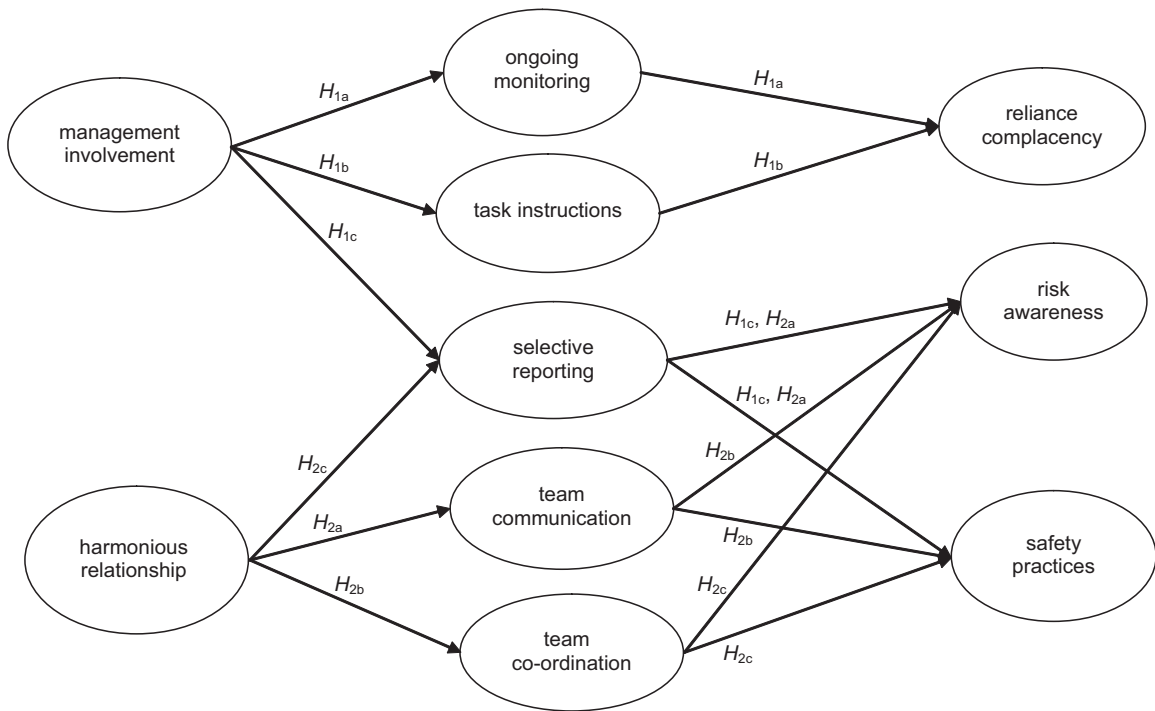
Figure 1. The proposed structural model of the present research. *Notes. H*—hypothesis.

improves employees' safety performance [7, 28]. In a relationship-oriented culture, upper- and middle-level management involved in an organization's critical safety meetings and activities play a vital role in safety management. Management in a relationship-oriented culture tends to act like a father of a family by setting an example for their subordinates and actively participating in safety activities and training [17, 18], and frequently mentioning their own safety concerns [25].

Greater involvement of upper management in safety activities should influence the supervisory practices of a company's line managers, e.g., prompting them to be more earnest in focusing on safety supervisions, giving more instructions on task status, and monitoring the progress of work better. However, an increase in the number of task instructions or pretask meetings could lead to reliance complacency among employees, who may falsely believe that they are safe as long as they follow line managers' instructions. On the other hand, an increase in ongoing monitoring might encourage employees to comply with safety procedures and regulations, and thus

reduce their reliance complacency. Therefore, we proposed the following two hypotheses.

Hypothesis H_{1a}: With more management involvement in safety activities in companies, line managers will be more involved in task instructions. More task instructions in companies will lead to greater employee complacency.

Hypothesis H_{1b}: With more management involvement in safety in companies, line managers will be more involved in ongoing monitoring. More ongoing monitoring in companies will reduce employee complacency.

Furthermore, the authority and power of upper management are unchallengeable in a relationship-oriented culture [17, 18, 19]. Thus, with greater involvement of upper management in safety practices, employees may want to satisfy its requests and, by reporting good news and hiding problems, avoid blame or punishment. Selective reporting by employees might lead to a decrease in employee risk awareness and compliance with employee safety practices. Therefore, the following hypothesis is proposed.

Hypothesis H_{1c}: More management involvement in safety in companies will lead to more selective reporting. With more selective reporting in companies, risk awareness and adherence to safety practices will be reduced.

2.2. Harmonious Relationship and Safety Performance

Maintaining group harmony is deeply embedded in the cultural traditions and social values in relationship-oriented cultures [14, 18, 29]. Taiwanese pilots highly value good relationships with managers and co-workers [16]. Harmonious relationships in the workplace encourage employees to develop mutual trust [12]. Trust should lead to employees helping one another and openly sharing safety information in the workplace [25]. Good information sharing and team collaboration effectively shape group safety climate [5]. Good safety climate in teams should, in turn, increase risk awareness and help improve safety practices [30, 31, 32]. Therefore, we proposed the following two hypotheses.

Hypothesis H_{2a}: Greater harmony among team members in companies will improve communication among team members. In turn, risk awareness and safety practices will be enhanced.

Hypothesis H_{2b}: Greater harmony among team members will improve co-ordination among team members. In turn, risk awareness and safety practices will be enhanced.

However, a harmonious work relationship may have a negative influence on safety reporting. To maintain harmony and reciprocity with superiors and co-workers [19, 28, 29], which are important in a relationship-oriented culture, employees may selectively report only good news and cover co-workers' mistakes. Co-workers consider reporting a colleague's mistakes to one's superior a betrayal and see it as unethical. In the workplace, selective reporting may also decrease other employees' awareness of safety conditions, making them less inclined to implement safety practices or follow safety rules. Therefore, we proposed the following hypothesis.

Hypothesis H_{2c}: With greater harmony among team members in companies, employees will selectively report on safety issues or mishaps. With more selective reporting, risk awareness and safety practices will be reduced.

3. METHOD

3.1. Participants

The participants were recruited from the 553 frontline workers of high-risk industries in Taiwan, including oil and steel refinery plants. Table 1 shows their characteristics. The questionnaires were distributed during work hours. The investigators described the procedures of the study and members of the research team supervised the process. The questionnaires were completed anonymously and collected immediately by an investigator, with assurance of absolute confidentiality.

TABLE 1. Respondents ($N = 553$)

Demographic Variable		Employees (%)
Gender	male	525 (95)
	female	28 (5)
Age (years)	21–30	33 (6)
	31–40	127 (23)
	41–50	205 (37)
	51–60	177 (32)
	>61	11 (2)
Job	plant services	61 (11)
	shop floor	464 (84)
	other	28 (5)
Work experience (years)	<5	44 (8)
	6–10	83 (15)
	11–15	94 (17)
	16–20	122 (22)
	21–25	111 (20)
	>25	99 (18)

3.2. Research Measures

Safety climate is a multidimensional concept reflecting employees' perceptions of the policies, procedures, and practices related to safety [33]. Over the past 30 years, many researchers have

developed measuring instruments to explore the dimensions of safety climate [5, 7, 34, 35, 36, 37]. However, they have reached no consensus on the factors constituting safety climate to date [3, 38]. Therefore, the choice of safety climate factors can be partially determined by practical interest and characteristics of different industries or countries [39].

This study used a safety climate survey questionnaire, adapted from the one developed by the Central Research Institute of Electric Power Industry in Japan [40, 41]. The reliability and validity of the Taiwanese version was demonstrated in earlier studies of different high-risk industries, including petrochemical, nuclear power, and manufacturing [25]. We selected several factors concerning the organizational, work group, and individual level. Questionnaire items were reorganized according to those factors and then tested with the confirmatory factor analysis (CFA). Cronbach's α established item reliability for each factor. The questionnaire used a 5-point Likert scale (1—*strongly disagree,* 5—*strongly agree*).

3.2.1. Management involvement

Four items measured the extent to which the upper management were involved in critical safety meetings and activities. Cronbach's α for this scale was .84. A sample item was "The company management participates personally in safety meeting".

3.2.2. Harmonious relationship

Four items measured the extent to which there was a harmonious work atmosphere among the co-workers and the supervisors in their organization. Cronbach's α for this scale was .81. A sample item was "Interpersonal relationships at the workplace are harmonious".

3.2.3. Task instructions

Four items measured the employees' perception of the line managers' instructions on task performance. Cronbach's α for the scale was .75. A sample item was "The line manager provides instructions on safety preparations".

3.2.4. Ongoing Monitoring

Four items measured the extent to which the supervisors monitored employee safety in daily activities. Cronbach's α for the scale was .71. A sample item was "Supervisors often monitor safety tasks of employees in the workplace".

3.2.5. Selective reporting

Two items measured the extent to which the employees were willing to selectively report safety issues. Cronbach's α for the scale was .64. A sample item was "When reporting to upper management, employees often report good information but hide safety problems in the workplace".

3.2.6. Team communication

Four items measured the extent to which safety information was shared and exchanged actively among team members. Cronbach's α for the scale was .75. A sample item was "In the workplace, employees can openly talk about safety related issues".

3.2.7. Team co-ordination

Four items reflected the extent of collaboration among team members. Cronbach's α for the scale was .68. A sample item was "Team members help each other finish work".

3.2.8. Reliance Complacency

Two items measured the extent to which the employees blindly followed the management's directives and procedures. Cronbach's α for the scale was .61. A sample item was "Employees follow management decisions without questioning".

3.2.9. Risk awareness

Four items measured the employees' perception of risk at work. Cronbach's α for the scale was .80. A sample item was "When in doubt about safety, I proceed with great caution".

3.2.10. Safety practices

Five items measured risk-taking and compliance with safety rules and procedures. Cronbach's α for the scale was .78. A sample item was: "I check safety rules and procedures before work".

3.3. Approach to Data Analysis

The CFA was used to examine the construct validity of the measurement model of the factors, using LISREL [42]. We used structural equation modeling (SEM) to examine hypothetical relationships of the proposed safety management model. The study used several goodness-of-fit indices that had been used previously to evaluate the measurement model (CFA) and the structural model (SEM) [42, 43, 44, 45]. These indices include χ^2, normed fit index (NFI), non-normed fit index (NNFI), comparative fit index (CFI), incremental fit index (IFI), and root-mean-square error of approximation (RMSEA).

4. RESULTS

Table 2 shows the descriptive statistics and intercorrelations among the factors. Cronbach's α for each factor was over .60, suggesting that the factors had adequate internal consistency reliability [46, 47]. According to the CFA, the overall measurement model fit was $\chi^2(584) = 2297.77$, $p < .01$. The RMSEA of .073 (under .080) indicated that the measurement model had a reasonable fit. Since χ^2 is affected by sample size, other fit indices had to be used. Other indices (NFI = .91, NNFI = .92, CFI = .93, IFI = .93) were over or close to .90, indicating that the measurement model was acceptable. Summing up, the test results indicated that the construct validity of the organizational factors was adequate.

According to the SEM, the overall fit index of the structural model was $\chi^2(614) = 2521.86$, $p < .01$. The RMSEA was .075 (under .080), indicating the structural model was reasonable. Other indices (NFI = .91, NNFI = .92, CFI = .93, IFI = .93) were over or near .90, indicating that the structural model was acceptable. On the whole, the test results indicated that

the Taiwanese structural model was adequate. Figure 2 shows that the coefficients of all structural paths were significant.

The results of structural model testing revealed that in companies whose management were more involved in safety, line managers paid more attention to safety supervision, including task instructions ($\gamma = .83$, $p < .01$) and ongoing monitoring ($\gamma = .71$, $p < .01$). However, in companies where they emphasized task instructions, employees reported more reliance complacency ($\beta = .55$, $p < .01$), supporting hypothesis H_{1a}. In companies whose line managers were more involved in ongoing monitoring, employees reported less reliance complacency ($\beta = -.77$, $p < .01$), supporting H_{1b}. In companies with upper management more involved in safety, there was more selective reporting ($\gamma = .24$, $p < .01$). In companies where there was greater selective reporting, risk awareness, and safety practices were reduced ($\beta = -.61$, $p < .01$ and $\beta = -.44$, $p < .01$, respectively), supporting H_{1c}.

The results also revealed that in companies where interpersonal relationships of team members were harmonious, there was better co-ordination ($\gamma = .51$, $p < .01$) and communication ($\gamma = .81$, $p < .01$). Where there was better co-ordination and communication, there was greater risk awareness ($\beta = .67$, $p < .01$; $\beta = .60$, $p < .01$) and more safety practices ($\beta = .84$, $p < .01$; $\beta = .77$, $p < .01$), supporting both H_{2a} and H_{2b}. However, in companies with more harmonious relationships, there was greater selective reporting ($\gamma = .75$, $p < .01$). In companies with greater selective reporting, risk awareness ($\beta = -.61$, $p < .01$) and safety practices ($\beta = -.44$, $p < .01$) were reduced, supporting H_{2c}.

5. DISCUSSION

A relationship-oriented culture is predominant in the Greater China region. For a long time, paternalistic leadership style and group harmony, embedded in such cultures, have exerted a strong influence on interactions among group members and relationships between leaders and subordinates [13, 14, 17, 18, 19, 22]. However, in the research to date we found little focus on how the

TABLE 2. Descriptive Statistics and Intercorrelations for All Variables in the Present Study (*N* = 553)

| Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1 Management involvement	3.90	0.73	—									
2 Harmonious relationship	3.93	0.59	0.45***	—								
3 Selective reporting	3.54	0.61	0.27***	0.25***	—							
4 Ongoing monitoring	3.82	0.66	0.74***	0.50***	0.25***	—						
5 Task instructions	3.88	0.67	0.80***	0.47***	0.24***	0.76***	—					
6 Team co-ordination	3.92	0.57	0.65***	0.62***	0.28***	0.69***	0.66***	—				
7 Team communication	3.76	0.63	0.54***	0.58***	0.27***	0.66***	0.62***	0.63***	—			
8 Risk awareness	4.20	0.49	0.22***	0.25***	0.23***	0.23***	0.20***	0.29***	0.18***	—		
9 Safety practices	4.11	0.51	0.53***	0.42***	0.32***	0.50***	0.55***	0.54***	0.41***	0.62***	—	
10 Reliance complacency	3.25	0.68	−0.15***	−0.12**	0.19***	−0.25***	−0.14***	−0.15***	−0.16***	0.04	0.01	—

Notes. ****p* < .001.
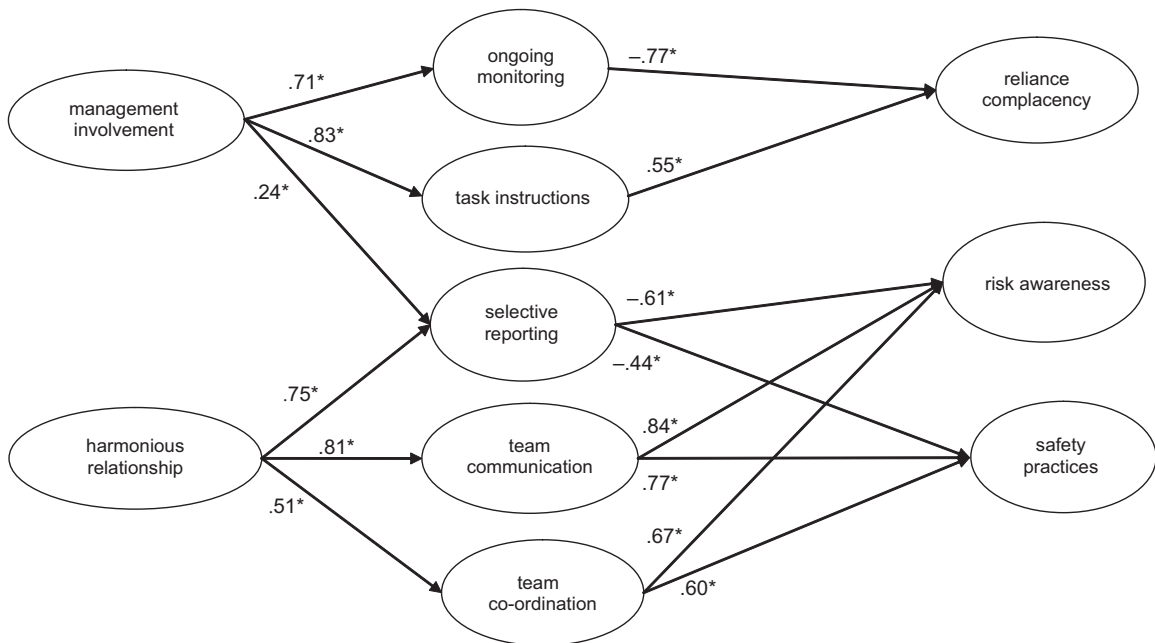
Figure 2. Results of the structural model with standardized path coefficients. *Notes.* **p* < .01.

characteristics of relationship-oriented cultures might affect operational safety management in high-risk industries. This study attempted to explore the possible influence mechanisms of safety management in relationship-oriented cultures on Taiwanese high-risk industries. The results support the initial hypotheses that management involvement and harmonious relationships in a relationship-oriented culture have a significant influence on safety supervision and the group work process, which, in turn, influence individual risk awareness and safety practices. In

the next paragraphs we discuss the findings and their proposed implications for improving workplace safety in a relationship-oriented culture.

Firstly, we found that upper management in a relationship-oriented culture were actively involved in safety promotion activities to demonstrate their high commitment to safety. For that reason, line managers were more involved in supervisory activities and task instructions, and employees' reliance complacency was high. Where line managers were more involved in ongoing monitoring, reliance complacency was

low. In the workplace, task instructions from line managers are necessary for safety operations, but this may lead to employees' reliance complacency.

Although task instructions from line managers in the workplace are important, increased ongoing monitoring helps avoid employees' reliance complacency. Therefore, line managers should set goals for employees and explain exactly what they expect. They should also be responsible for training their subordinates and participate in training courses where safety policies and procedures are introduced and reviewed. While reviewing safety-related activities and training employees in safe job procedures in the workplace, line managers should provide instructions for tasks and routinely remind workers of safety rules. Moreover, line managers should emphasize the importance of continuous improvement in the workplace. Employees with continuous improvement attitudes will increase their capabilities of organizational change [48] and reduce reliance complacency, which will help improve organizational safety climate.

Secondly, workers' effort to keep harmonious relationships is a very important feature in Taiwanese workplaces, an important social value in a relationship-oriented culture. We found that in companies with a harmonious work atmosphere, there was better communication and co-ordination among team members, which enhanced risk awareness and safety practices. Therefore, management should reinforce team building. Building high-performance teams and maintaining harmonious interpersonal relationships are critical to improving teamwork effectiveness in relationship-oriented organizations. Harmonious interpersonal relationships can increase both group cohesiveness and trust among team members, which enhance group communication and co-ordination. Although it is important to maintain group harmony in the workplace, management should actively promote organizational identity by emphasizing team performance. Team performance should be measured in an unbiased manner and teams should be given unambiguous feedback. Rewards should be contingent on teams' performance,

rather than be a personal favor. This method of rewarding enhances trust among team members. Trust among management and co-workers will not only promote the quality of teamwork, but will also improve employees' risk awareness and safe behavior in the workplace.

Thirdly, more involvement of upper management in safety and maintaining harmonious relationships can also have a detrimental effect on safety management. We found that with more upper management involvement in safety and greater harmony in team relationships, there was more selective reporting. In companies where safety reports were selective, risk awareness and safety practices were poor. To minimize those detrimental effects, management should build a good accountability system in which both safe and unsafe behavior is evaluated, and rewards and penalties resulting from those evaluations are consistently assigned [49]. Most importantly, a fair and just culture should be established in the workplace [2]. Management should not favor those close to them to avoid the negative effects of the relationship. They should clearly define job tasks, rules, and regulations for the work environment to avoid unfair treatment of employees, and should provide unbiased performance standards and evaluation tools. Furthermore, management should strive to build a good reporting culture [2]. A good reporting culture should allow for the free and uninhibited reporting of safety issues during employees' daily activities [50]. Reporting systems should be focused on potential hazards in the workplace rather than on human errors. In view of harmonious relationships, preserving personal dignity (saving face) of those involved in an incident might make reporting more acceptable to employees [19, 24].

This study is cross-sectional, which limits the degree of inference for a safety management model in a relationship-oriented culture. In the future, longitudinal studies should be conducted to investigate causal effects. Also, previous studies indicated that leadership styles, such as transformational or leader–member exchange, predicted safety outcomes [8, 9]. Therefore, the influence of leadership styles on safety management should be further explored. Notwith-

standing those limitations, this study aimed at understanding the influence of organizational factors on workers' perceptions of safety and organizational behavior. It presented a first look at safety management in relationship-oriented cultures. Future studies must extend research to other facets of relationship-oriented cultures.

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