




“Perceptual attitudes towards safety climate among employees of a manufacturing firm: A qualitative approach”

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PERCEPTUAL ATTITUDES TOWARDS SAFETY CLIMATE AMONG EMPLOYEES OF A MANUFACTURING FIRM: A QUALITATIVE APPROACH

Abstract

Safety climate can be regarded as a summary of moral perceptions that employees share about their work environments. This study explores the attitude of employees (working on production sites) towards the safety climate of a manufacturing firm producing medical equipment located in Kuala Lumpur (Malaysia). The data were collected through an open-ended questionnaire from 30 employees working in the manufacturing section of Setia Tek Limited. All the responses from open-ended questionnaires were analyzed descriptively and interpretively simultaneously using a thematic content analysis method. The findings indicate that the overall perception of the majority (67%) of employees about safety climate is positive. The research findings further reveal that majority of employees share a common understanding of the significance of the managerial strategies in business operations. With regard to the contribution of dimensions to shaping safety climate perceptions, the analysis reveals that all nine dimensions (safety concept, risks associated with daily work, cause of accidents, safety policies, regulations, and procedures, balance productivity goals and safety goals, commitment of the upper management, commitment of the immediate supervisor/ manager, commitment of employees, adequate training and competency, disciplinary actions for safety violations, accident investigations) positively contribute to employees' safety perceptions.

Keywords

safety climate, safety climate dimensions, safety culture, manufacturing firms, employee perceptions

JEL Classification

I31, J24, J28, J81

INTRODUCTION

Although advances in safety and health programs have reduced the incidents of occupational accidents, injuries, and diseases, these programs will not succeed unless they are supported by a positive workplace safety climate (Tetzlaff et al., 2021). Today, most workplaces in any type of industry succumb to a lot of potential hazards and dangerous situations. They are prone to several kinds of accidents, diseases, and injuries, which significantly contributes to the interference of work processes and eventually create heavy financial costs. According to LaDou et al. (2018), the world's labor force experiences at least 370 million injuries every year, a figure that could be much higher if a more reliable analysis was conducted.

Safety climate and culture are considered to be integral parts of the organizational climate and culture (Shea et al., 2021). Safety culture provides an environment in which individual safety attitudes are developed and maintained and safety behavior is promoted. Safety climate is regarded as "...the manifestation of safety culture in the behavior and attitude of employees" (Cox & Flin, 1998). Zohar (1980) defines

safety climate as a summary of employees' moral perceptions of their work environments as a frame of reference for guiding appropriate and adaptive task behavior. According to Griffin and Neal (2000), employees' attitudes towards safety-related policies, procedures, and practices constitute safety climate. Zohar (2003) argues that the safety climate reflects the true perceived priority of safety in an organization. The safety climate is a reflection of the current state of the underlying safety culture (Mearns et al., 2003).

In Malaysia, there are different types of manufacturing industries, which include textiles, petrochemicals, automotive, plastics, wood-based, and electronics among others. Using a case-study method, this empirical investigation has selected Setia Tek Company Limited, hereafter, STCL, located in Kuala Lumpur (Malaysia) to be the focus. The risk of involvement in any type of accident at the worksite, in newly developed countries such as Malaysia, is still on high trend. From the data on the Occupational Accident Statistics by Sector released by the Malaysian Department of Safety and Health (MDSH), the rate of total occupational accidents was reduced in 2017, compared to 2016, but increased in 2018 (MDSH, 2016, 2017, 2018). The death, casualty, permanent disability (PD), and non-permanent disability (PDA) incidences showed an increasing trend from 2016 to 2018.

In the past, traditional strategies of promoting safety in organizations focused mainly on investigating accident cases to identify root causes and offer practical corrective actions (Hall et al., 2013). Lately, many companies have shifted from such a mindset and adopted a preventive strategy, which gave emphasis on predictive programs that periodically assess the safety climate (Flin et al., 2000; Carder & Ragan, 2003).

1. LITERATURE REVIEW

Different scholars have defined safety climate from different perspectives. According to Griffin and Curcurutu (2016), a safety climate is a multi-dimensional construct that can be developed from a group of individuals' perceptual values attached to it in a work environment. In many studies, there are voluminous discussions on the empirical relationships between safety climate and safety culture (Shannon & Norman, 2009; Mearns & Flin, 1999; Lin et al., 2008).

Cooper and Philips (2004) define safety climate as commonly accepted beliefs among employees about the safety performance of an organization and as a tool to signify potential failures in safety systems. For them, a safe climate is one of the vital ingredients to positive safety culture. Safety climate is described as commonly agreed views among the affiliates of an entity about the safety rules and programs in an organization.

With the understanding that safety outcomes are predicted by safety climate (Jiang et al., 2018), it is imperative to identify the key dimensions that contributed to safety climate from the perspec-

tives of organizational members. Although many researchers have administered surveys on safety climate in different settings, they failed to agree on the common dimensions of this concept (Chen & Chen, 2012; Vinodkumar & Bashi, 2009). The literature review shows that management commitment to safety is one of the common dimensions of safety climate (Evans et al., 2007). A few research findings have recommended that there might be a significant positive relationship between a superior's very own outlook and view of safety on the influence of his/her workers' safety climate (Huang, 2014).

Seo (2005) outlined five themes of safety climate: management commitment to safety, supervisor safety support, co-worker safety support, employee participation in safety decision-making and activities, and competence level of employees about safety. Schwatka et al. (2016) reviewed forty-six articles on safety in the construction industry conclude that safety climate is explained as perceptual orientations of individuals, but the focal point of those perceptions differs extensively. Olsen (2010) finds five commonly accepted safety climate variables, which include management support, supervisor/manager expectations, and com-

mitment to safety, teamwork, learning, and feedback. Although agreement on the key dimensions of safety climate has not been achieved, the relevance of safety climate, in association with safety performance, has commonly been accepted in various types of industries (Lyu et al., 2018). Some studies added *work pressure* (Flin et al., 2000) or *pressure for production* (Davies et al., 2001) as another dimension of safety climate.

The awareness of the significance of safety performance on organizational success has become more prominent in the literature. Safety climate, as one of the factors, which shape the organizational environment, offers a route for effective safety performance management (Kines et al., 2011). In a pioneer study on safety, which was conducted in 20 companies, Zohar (1980) confirmed that safety climate has a linear relationship with safety-related outcomes.

Safety climate intends to reveal the sorts of practices that support and reward. In other words, the first level of safety climate reflects the perceptual views of individuals towards safety policy and its implementation efforts. The second level manifests the extent to which those individuals believe that safety is embraced and regarded across the organization. Social exchange theory and expectancy-valence theory are two theoretical linkages that could guide us to better understand the positive association between safety climate and safety behavior (Neal & Griffin, 2006). Social exchange theory describes that when an entity is giving attention to the well-being of the employees, they are inclined to develop reciprocal commitment to contribute back meaningfully (Hon et al., 2014). They are willing to be committed and go beyond the call of duty to ensure that their organizations achieve all the goals. Hofmann and Morgeson (1999) conclude that when an employer puts emphasis on safety, its employees respond by adhering to the safety policies and regulations and improve their work performances.

A meta-analysis on safety climate and safety performance studies by Clarke (2006) and Christian et al. (2009) conclude that safety climate is a significant variable contributing to positive safety performance. Safety climate contributes to enhancing safety inclination and safety competence among

employees, which eventually leads to safer behavioral orientations, and reduced accidents and injury rates.

Malaysia is a developing country where the topic of safety climate is still not so prevalent and widely discussed in open forums. The literature review clearly highlights the lack of empirical studies on the safety climate in a Malaysian working environment.

Based on the highlighted gap, this study aims to explore the employees' perception of the safety climate using a manufacturing firm and its safety conditions as an example.

2. METHODS

This study adopts qualitative research methodology using a case study approach to achieve the objectives. The primary data was collected through an open-ended questionnaire designed by fulfilling two important research practical criteria: (i) the realization that these questions require some thinking processes and a reasonable command of English. It would be a challenge for lower-level employees if they are included in the sample, (ii) the researcher does not have the luxury of time to wait for responses from the respondents. A big sample size requires more complicated time management. From 30 respondents selected, twenty-two (22) responded to the open-ended questionnaires online and they are suitable for analysis. Open-ended questions allow the respondents to express elaborative answers to the posted questions (Hyman & Sierra, 2016). Eleven (11) open-ended questions are included in another survey link (<https://salford.onlinesurveys.ac.uk/safetyclimateinterview>) through Bristol Online Survey Tool.

To answer the research question, thematic content analysis is used to analyze the data gathered from the open-ended questionnaires. This is one of the most common methods used in essay-type survey questions. The responses from open-ended questionnaires are subject to both descriptive and interpretive coding /categorizing simultaneously. The steps suggested by Connors (2018) are followed where the first step in this process is to identify/locate units of data that are relevant to

the research question. A unit of data could be a phrase, a sentence, or an entire paragraph. The next step is to assign a code/category to each unit of data. Then inferences are made of the data according to the contexts of the questions.

3. RESULTS

The thematic content analyses of the open-ended survey responses start with focusing on the writ-

ten expression of the respondents for each question. The unit of analysis is usually a sentence or multiple sentences, which addresses the question presented in the questionnaire. It should be noted that some responses have grammatical errors as the respondents are not native English speakers. The findings of the thematic content analysis are presented in Table 1.

Table 1 outlines the major codes and themes (column 2 and 3) covered in the questionnaire. The

Table 1. Results of thematic content analysis

Questions	Major code	Major themes/ideas	Useable responses	Non-useable responses
1. Can you briefly describe your beliefs/ understanding about the concept of safety?	Safety concept	Safe workplace, rules and regulations, minimized risks and hazards, prevention	20	2
2. Can you briefly describe about the risks associated with your daily work and responsibilities?	Risks associated with daily work	Types of different risks, less risks due to office work	20	2
3. From your perspective, what are the main causes for workplace accidents in your company?	Causes of accidents	Carelessness/ negligence/ human errors/ negative work habits, not conforming to work standards (SOP) / not following safety procedures, lack of campaign and awareness programs, technological errors/ old machines/ poor equipment maintenance, lack of supervision	22	0
4. In your perspective, do your company's safety policies, regulations and procedures are adequate to guarantee a safe workplace?	Safety policies, regulations, and procedures	Adequate but needs improvement, adequate, inadequate	22	0
5. From your experience, how does your company balance the emphasis on productivity goals and work safety requirements?	Balance productivity goals and safety goals	Balance on both goals, more emphasis on safety goals, more emphasis on productivity goals	19	3
6. What are your perspectives regarding the commitment of the upper management towards work safety in your company?	Commitment of the upper management	Committed, lack of commitment	22	0
7. What are your perspectives regarding the commitment of the individual employees towards work safety in your company?	Commitment of the immediate supervisor/ manager	Some are committed, some are not committed, lack of commitment, all are committed	21	1
8. What are your perspectives regarding the commitment of the individual employees towards work safety in your company?	Commitment of employees	Some are committed, some are not committed, lack of commitment, all are committed	21	1
9. Do you feel that the employees in your company have adequate training and competency to practice proper safety behavior while performing the work?	Adequate training and competency	Adequate training provided but there is still a gap, adequate training provided, training provided not adequate, not all employees have equal chance to attend training	21	1
10. Is the disciplinary actions for safety violations are professionally implemented in your company?	Disciplinary actions for safety violations	Professionally implemented, not professionally implemented, not sure about it	21	1
11. Explain briefly how accident investigations were conducted in your company?	Accident investigations	Report to immediate supervisor, report to manager, not sure	21	1

columns (4 and 5) represent the number of useable and non-useable responses. The results show that majority of the responses were useable as the respondents fairly understood the thematic coverage of the questions.

The results represent that the 'safety concept' code covered four themes (safe workplace, rules and regulations, minimized risks and hazards, and prevention). The total useable responses were 20 and non-useable were 2. The results of thematic coverage in this code indicated that majority of the respondents represented an adequate understanding of workplace safety and described it as the creation of danger free workplace having good work ethics (respondent 18 and 5). While, responding this question, a few other thematic areas were reported such as respondents 17 and 20 described work safety is crucial and should must ensure the safety of each employee. Another respondent (13) submitted that modern work place is full of risks and dangers, and efforts should be made to minimize these risks and dangers. Prevention was another theme noticed as the respondents highlighted that safety at work is the creation of safe and healthy environment where safety requirements are fulfilled and measures are taken to avoid injuries and death (respondents 3, 16, 17, and 20).

The results in column 3 represent that 'types of different risks' and 'less risks due to office work' were loaded as the themes for 'risks associated with daily work' code (column 2) and the total useable responses were 20 and non-useable were 2. Some of the risks reported were related to stress due to the over-load of assignments, injuries due to faulty machines, and electrical, mechanical, chemical, and psychological factors were perceived as the potential risks (respondents 1 and 5). The findings of this code also indicated that working in the office is less risky as compared to production sites (respondents 8 and 9).

The findings (column 3) indicate that 'careless/negligence/ human errors/ negative work habits', 'not conforming to work standards (SOP) / not following safety procedures', 'lack of campaign and awareness programs', 'technological errors/ old machines/ poor equipment maintenance', and 'lack of supervision' were loaded as the themes for 'causes for accidents' code and total useable re-

sponses were 22. The respondents identified that lack of information about work process, systems and machines, fatigue and lack of awareness about safety, strict compliance with SOP, arrogance at work, lack of awareness campaigns, technology, climate, human errors, and human errors are the main reasons for the accidents at work (respondents 1, 4, 5, 10, and 17).

The results for the 'safety policies, regulations and procedures' code indicate that 'adequate but needs improvement', 'adequate', and 'inadequate' were loaded as the themes (column 3) and the total useable responses were 22. The respondents disclosed that their company's policies, regulations, and procedures on safety are adequate however, some safety elements are in need of immediate and continuous commitment from the management (respondents 1, 10, 11, 14, and 20).

Also, the findings of the 'balance productivity goals and safety goals' code represent that 'balance on both goals', 'more emphasis on safety goals', and 'more emphasis on productivity goals' were loaded as the themes (column 3) and total useable responses were 19 and non-useable responses were 3. Overall, respondents reported the company balances and emphasize both performance and safety goals and the supervisors encourage employees to adhere to safety regulations (respondents 2, and 10). The employees further disclosed that the safety of employees is prioritized over performance through monitoring of operational activities (respondents 14, and 15). Another category of respondents perceived that STCL management prioritizes productivity goals over safety as the regulations and guidelines lack actual implementation due to the lack of funds provision (respondents 1, 6, 17, and 20).

The findings of the 'upper management commitment' code reveal that 'committed' and 'lack of commitment' were loaded as the themes (column 3), and total useable responses were 22. It is noticeable that the majority of the respondents' views that upper management is strongly committed, regularly communicates about safety and allocates sufficient funds towards it (respondents 6 and 8). A few respondents were unhappy with less serious attitude of upper management about safety (respondents 5 and 22).

The results of 'immediate supervisor commitment' code revealed that 'committed' and 'commitment needs improvement' were loaded as the themes (column 3), and total useable responses were 21 and non-useable were 1. Altogether, 19 respondents believed that their immediate supervisors are committed and have identical views of ensuring employees' safety within the company (respondents 3 and 7). While some employees perceive that the supervisors require top management support and need to improve their safety skills for the creation of a better safety environment (respondents 5 and 20).

The findings pertaining to the 'commitment of employees' code indicate that 'some are committed', 'some are not committed', 'lack of commitment', and 'all are committed' were loaded as the themes, and total useable responses were 21 and non-useable were 1. The majority of responses reflect their perceptions of a mixed scenario with regard to the individual employee's commitment to work safety. Generally, employees are committed to safety and occasional accidents are fated which might incur due to employees' attitude and lack of experience towards safety (respondents 3 and 12). The employees' awareness towards safety is low, and the peers need to intervene to train the new employees (respondents 2 and 7).

The findings related to 'adequate training and competency' code reveal that 'adequate training provided but there is still a gap', 'adequate training provided', 'training provided not adequate', and 'not all employees have equal chance to attend training' were loaded as the themes (column 3) and total useable responses were 21 and non-useable were 1. Some respondents feel that the training on work safety is adequate, but a big gap between theory and practice among employees remains. The training provided by the Company is adequate but there is still a wide gap between putting the theory from training into a real work environment (respondent 2). Many trainings on safety have been provided. But what is still lacking is the commitment to put into practice what they have collected from training sessions (respondent 6). However, a few employees highlighted the inadequate provision of safety due to dynamic changes in the work environment, wrong selection of training programs and lack of moti-

vation to attend training as the factors of lowering safety at workplace (respondents 12, 13, and 21).

The findings of the 'disciplinary actions for safety violations' code delineated that 'professionally implemented', 'not professionally implemented', and 'not sure about it' themes were loaded (column 3), and total useable responses were 21 and non-useable were 1. Majority of the employees hold the view that disciplinary action against any safety violation is handled with a high spirit of professionalism (respondents 3 and 13). While some respondents have negative feelings about the way disciplinary action on safety related rule breaking (respondents 7 and 20). A few respondents are clueless about this issue of disciplinary process related to safety (respondents 12, 19, and 22).

Finally, the findings of the 'accident investigation' code revealed that 'report to immediate supervisor', 'report to manager', and 'not sure' were loaded as the themes (column 3), and 21 responses were useable and 1 was non-useable. Overall, it was observed that employees knew to whom the accident should be reported and recognized that their immediate supervisors formally recorded it for necessary actions (respondents 3 and 11). Another cluster of respondents highlighted those accidents should be reported to manager before forwarding to the management for final decision (respondent 6). Some respondents were not sure about the reporting process of accidents as these employees were not formally informed about the reporting process (respondents 8 and 19).

4. DISCUSSION

The findings of safety climate represent that STCL's employees have a genuine concern for employees' overall safety at workplace. The findings of safety concept dimension stressed that a firm needed to focus on overall safety of employees and must protect employees from injuries and harmful effects. The results elucidated employees represent a genuine concern about the safety of their peers at STCL. This leads to confirm that firms need to focus on creating a risk-free working environment having minimal health and physical risks. The findings of this dimension lead to predicting that employees share a positive perception of safety climate.

The findings related to upper management's commitment represent that STCL's upper management has shown genuine concern for timely resolution of safety issues of employees. The findings have further highlighted that although no potential incidents were reported yet, the management is willing to sacrifice productivity in the assignments which jeopardize employees' safety. The upper management has taken employees' safety one step further by spending and investing to create a safe workplace. The findings of this study are consistent with the findings of past studies (Seo, 2005; Olsen, 2010) confirming upper management commitment is a key dimension of safety at the workplace as it plays a detrimental role in the creation of a safe workplace. Additionally, findings of immediate supervisor/managers commitment delineated a similar finding as employees highlighted that their immediate supervisors always take initiatives to ensure safety. These findings suggest that supervisors and managers are the key players at the enforcement front (Olsen, 2010).

The findings of employees' personal commitment of safety represent that it is based on the nature and requirements of certain job that also determine the effectiveness of organizational safety programs. However, employee perceptions fluctuate towards workplace safety as some employees showed less commitment due to a lack of exposure to certain safety instructions. Meanwhile, the results on organizational safety policies and regulations outline that STCL has taken measures to improve and correct the wrongly functioning safety policies through the acquisition of essential resources and relevant tools. The findings of

underlying beliefs about safety indicate an interesting perspective as the majority of respondents believe the pre-destined reasons for incidents can be associated with employees' religiosity. The results of the clash between performance and safety goals determined that the management focus on achieving an equilibrium between organizational goals and safety goals as the former can only be achieved by creating a safe workplace environment (Mathis, 2017).

The findings on safety competence level indicate that employees' cognitive skills, preliminary knowledge, and understanding of basic procedures and regulations play a key role in shaping safety competence. Additionally, organizations also contribute to enhancing employees' safety competency levels by conducting training programs, especially for newly recruited employees. Also, exposure to real-life situations has significantly enhanced employees' competency levels. Moving on to findings of communication systems used for safety indicate that safety policies and regulations are clearly communicated periodically at all levels. The further analysis of this dimension demonstrated that the communication process within the organization is based on mutual trust and collegial spirit among upper management, supervisors/managers, and the employees themselves. Finally, the results of disciplinary systems and measures highlighted that it is essential for a firm to implement an accountability system for the employees violating safety policies and regulations to maintain professionalism to create an exceptionally safe working environment.

CONCLUSION

Overall, the findings represent that STCL employees have a positive perception of the safety climate. The majority of employees share a common understanding of the significance of safety as one of the managerial strategies in business operations and that all proposed dimensions in this study are essential in shaping their perceptions.

From an implication perspective, the findings of this study require top management and employees at STCL should not be contented with the findings of this study and begin to foster a *laissez faire* attitude towards safety. They should mobilize their energy to improve continuously. This study suggested that having continuous improvement programs is imperative for creating a sound safety climate in an organization. The overall impressions are positive where the majority of employees feel that the upper management is committed to safety and places equal emphasis on performance and safety goals. However, it is

highly recommended that the upper management seriously looks into the minority group of employees who are not yet convinced. This attitude of upper management is vital to ensure that all employees understand that the struggle for safety is not contradictory to productivity, but rather complementary.

AUTHOR CONTRIBUTIONS

Conceptualization: Abdullah Muzakkir Razali.

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Funding acquisition: Razali Mat Zin.

Investigation: Abdullah Muzakkir Razali.

Methodology: Razali Mat Zin.

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REFERENCES

1. Atkinson, P. A., & Coffey, A. (1997). Analysing documentary realities. In D. Silverman (Ed.), *Qualitative research: Theory, method and practice* (pp. 45-62). London, UK: Sage.
2. Barling, J., Loughlin, C., & Kelloway, E. K. (2002). Development and test of a model linking safety specific transformational leadership and occupational safety. *Journal of Applied Psychology, 87*(3), 488-496. <https://doi.org/10.1037/0021-9010.87.3.488>
3. Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
4. Brown, R. L., & Holmes, H. (1986). The use of a factor-analytic procedure for assessing the validity of an employee safety climate model. *Accident Analysis and Prevention, 18*, 455-470. [https://doi.org/10.1016/0001-4575\(86\)90019-9](https://doi.org/10.1016/0001-4575(86)90019-9)
5. Carder, B., & Ragan, P. (2003). A survey-based system for safety measurement and improvement. *Journal of Safety Research, 34*(2), 157-165. [https://doi.org/10.1016/S0022-4375\(03\)00007-0](https://doi.org/10.1016/S0022-4375(03)00007-0)
6. Christian, M., Bradley, J., Wallace, J., & Burke, M. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology, 94*(5), 1103-1127. <https://doi.org/10.1037/a0016172>
7. Clarke, S. (2006). The relationship between safety climate and safety performance: A metaanalytic review. *Journal of Occupational Health Psychology, 11*(4), 315-327. <https://doi.org/10.1037/1076-8998.11.4.315>
8. Clarke, S., & Cooper, C. L. (2004). *Managing the Risk of Workplace Stress*. Routledge: Great Britain.
9. Cooper, M., & Phillips, R. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research, 35*(4), 97-512. <https://doi.org/10.1016/j.jsr.2004.08.004>
10. Cox, S., & Flin, R. (1998). Safety culture: Philosopher's stone or man of straw? *Work and Stress, 12*(3), 189-201. <https://doi.org/10.1080/02678379808256861>
11. Crossman, A. (2020). *An Overview of Qualitative Research Methods: Direct Observation, Interviews, Participation, Immersion, Focus Groups*. Thought.Co. Retrieved from <https://www.thoughtco.com/qualitative-research-methods-3026555>
12. Davies, F., Spencer, R., & Dooley, K. (2001). *Summary guide to safety climate tools. Prepared by MaTSU for the Health and Safety Executive*. Retrieved from <http://www.hse.gov.uk/research/otopdf/1999/oto99063.pdf>
13. DeDobbeleer, N., & Beland, F. (1991). Safety climate measure for construction sites. *Journal of Safety Research, 22*(2), 97-103. [https://doi.org/10.1016/0022-4375\(91\)90017-P](https://doi.org/10.1016/0022-4375(91)90017-P)
14. DeyJoy, D. M., Schaffer, B. S., Wilson, M. G., Vandenberg, R. J., & Butts, M. M. (2004). Creating safer workplaces: Assessing the determinants and role of safety climate. *Journal of Safety Research, 35*(1), 81-90. <https://doi.org/10.1016/j.jsr.2003.09.018>
15. Fang, D., Chen, Y., & Wong, L. (2006). Safety climate in construction industry: A case study in Hong Kong. *Journal of Construction Engineering and Management, 132*(6), 573-584.
16. Flin, R., Mearns, K., Connor, P., & Bryden, R. (2000). Measuring safety climate: Identifying the common themes. *Safety Science, 34*, 177-192. [https://doi.org/10.1016/S0925-7535\(00\)00012-6](https://doi.org/10.1016/S0925-7535(00)00012-6)
17. Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation.

- Journal of Occupational Health Psychology*, 5(3), 347-358. <https://doi.org/10.1037/1076-8998.5.3.347>
18. Gouldner, A. W. (1960). The norm of reciprocity. *American Sociological Review*, 25(2), 165-167. <https://doi.org/10.2307/2092623>
 19. Guldenmund, F. W. (2000). The nature of safety culture: A review of theory and research. *Safety Science*, 24, 215-257. [https://doi.org/10.1016/S0925-7535\(00\)00014-X](https://doi.org/10.1016/S0925-7535(00)00014-X)
 20. Griffin, M., & Curcuruto, M. (2016). Safety climate in organizations. *Annual Review of Organizational Psychology and Organizational Behaviour*, 3, 191-212. <https://doi.org/10.1146/annurev-org-psych-041015-062414>
 21. Hall, M., Blair, E., Smith, S., & Gorski, J. (2013). Development of a theory-based safety climate instrument. *Journal of Safety, Health & Environmental Research*, 9(1), 58-69.
 22. Health and Safety Executive. (2014). *Writing a health and safety policy*. Health and Safety Executive. Retrieved from <http://www.hse.gov.uk/toolbox/managing/writing.htm>
 23. Health and Safety Executive. (2005). *A review of safety culture and safety climate literature for the development of the safety culture inspection toolkit*. Retrieved from <http://www.hse.gov.uk/research/rpdf/r367.pdf>
 24. Hofmann, D., & Morgeson, F. (1999). Safety-related behavior as a social exchange: The role of perceived organizational support and leader-member exchange. *Journal of Applied Psychology*, 84(2), 286-296. <https://doi.org/10.1037/0021-9010.84.2.286>
 25. Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. *Personnel Psychology*, 49, 307-339. <https://doi.org/10.1111/j.1744-6570.1996.tb01802.x>
 26. Hon, C., Chan, A., & Yam, M. (2014). Relationships between safety climate and safety performance of building repair, maintenance, minor alteration, and addition (RMAA) works. *Safety Science*, 65, 10-19. <https://doi.org/10.1016/j.ssci.2013.12.012>
 27. Huang, Y., Roberston, M., Lee, J., Rineer, J., Murphy, L., Garabet, A., & Dainoff, M. (2014). Supervisory interpretation of safety climate versus employee safety climate perception: Association with safety behavior and outcomes for lone workers. *Transportation Research Part F: Psychology and Behaviour*, 26, 348-360. <https://doi.org/10.1016/j.trf.2014.04.006>
 28. Jiang, L., Lavaysse, M., & Probst, T. (2019). Climate and safety outcomes: A meta-analytic comparison of universal versus industry specific safety climate predictive validity. *Work and Stress*, 33(1), 41-57. <https://doi.org/10.1080/02678373.2018.1457737>
 29. Kines, P., Lappalainen, J., Mikkelsen, K., Olsen, E., Pousette, A., Tharaldsen, J., Tomasson, K., & Torner, M. (2011). Nordic safety climate questionnaire (NOSACQ-50): A new tool for diagnosing occupational safety climate. *International Journal of Industrial Ergonomics*, 41(6), 634-646. <https://doi.org/10.1016/j.ergon.2011.08.004>
 30. Labuschagne, A. (2003). Qualitative Research - Airy Fairy or Fundamental?. *The Qualitative Report*, 8(1), 100-103. <https://doi.org/10.46743/2160-3715/2003.1901>
 31. LaDou, J., London, L., & Watterson, A. (2018). Occupational health: A world of false promises. *Environmental Health*, 17(81), 1-8. <https://doi.org/10.1186/s12940-018-0422-x>
 32. Lin, S., Tang, W., Miao, J., Wang, Z., & Wang, P. (2008). Safety climate measurement at workplace in China: A validity and reliability assessment. *Safety Science*, 46(7), 1037-1046. <https://doi.org/10.1016/j.ssci.2007.05.001>
 33. Lyu, S., Hon, C., Chan, A., Wong, F., & Javed, A. (2018). Relationships among safety climate, safety behavior, and safety outcomes for ethnic minority construction workers. *International Journal of Environment Research and Public Health*, 15, 1-16. <https://doi.org/10.3390/ijerph15030484>
 34. MDSH, Malaysian Department of Safety and Health. (2019). *Occupational accidents statistics by sector from January until June 2019*. Kuala Lumpur: Ministry of Human Resources. Retrieved from <http://www.dosh.gov.my/index.php/ms/statistic-v/occupational-accident-statistics-v/occupationalaccident-statistic-2019>
 35. MDSH, Malaysian Department of Safety and Health. (2018). *Occupational accidents statistics by sector 2018*. Kuala Lumpur: Ministry of Human Resources. Retrieved from <http://www.dosh.gov.my/index.php/ms/statistic-v/occupational-accident-statistics-v/occupationalaccident-2018/3255-occupational-accidents-statistics-by-sector-2018-investigated/file>
 36. MDSH, Malaysian Department of Safety and Health. (2017). *Occupational accidents statistics by sector 2017*. Kuala Lumpur: Ministry of Human Resources. Retrieved from <http://www.dosh.gov.my/index.php/ms/statistic-v/occupational-accident-statistics-v/occupationalaccident-2017/3251-occupational-accidents-statistics-by-sector-until-october-2017/file>
 37. MDSH, Malaysian Department of Safety & Health. (2016). *Occupational accidents statistics by sector 2016*. Kuala Lumpur: Ministry of Human Resources.
 38. Malaysian Ministry of Human Resources. (1994). *Occupational safety and health Act (Act 514) 1994*. Kuala Lumpur: Government Printing Press. Retrieved from <http://www.dosh.gov.my/index.php/en/legislation/acts/23-02-occupational-safety-and-health-act1994-act-514/file>
 39. Mathis, T. (2017). *Safety performance excellence: Safety vs. productivity: If either wins, both lose*. EHS Today. Retrieved from <https://www.ehstoday.com/safety-leadership/safety-and-performance-excellence-safety-vs-productivity-if-either-wins-both-lose>
 40. Mearns, K., Whitaker, S.M., & Flin, R. (2003). Safety climate, safety management practice and safety performance in offshore environments. *Safety Science*, 41(8), 641-680. [https://doi.org/10.1016/S0925-7535\(02\)00011-5](https://doi.org/10.1016/S0925-7535(02)00011-5)

41. Mearns, K., & Flin, R. (1999). Assessing the state of organization safety – Culture or climate? *Current Psychology: Developmental Learning Personality Social*, 18(1), 5-17. <https://doi.org/10.1007/s12144-999-1013-3>
42. Mohamed, S. (2002). Safety climate in construction site environments. *Journal of Construction Engineering and Management*, 128(5), 375-384. [https://doi.org/10.1061/\(ASCE\)0733-9364\(2002\)128:5\(375\)](https://doi.org/10.1061/(ASCE)0733-9364(2002)128:5(375))
43. Neal, A., & Griffin, M. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology*, 91(4), 946-953. <https://doi.org/10.1037/0021-9010.91.4.946>
44. Olsen, E. (2010). Exploring the possibility of a common structural model measuring associations between safety climate factors and safety behavior in health care and the petroleum sectors. *Accident Analysis and Prevention*, 42(5), 1507-1516. <https://doi.org/10.1016/j.aap.2010.02.002>
45. O'Toole, M. (2002). The relationship between employees' perceptions of safety and organizational culture. *Journal of Safety Research*, 33, 231-243. [https://doi.org/10.1016/S0022-4375\(02\)00014-2](https://doi.org/10.1016/S0022-4375(02)00014-2)
46. Parker, S. K., Axtell, C. M., & Turner, N. (2001). Designing a safer workplace: Importance of job autonomy, communication quality, and supportive supervisors. *Journal of Occupational Health Psychology*, 5, 211-228. <https://doi.org/10.1037/1076-8998.6.3.211>
47. Probst, T. M. (2004). Safety and Insecurity: Exploring the Moderating Effect of Organizational Safety Climate. *Journal of Occupational Health Psychology*, 9(1), 3-10. <https://doi.org/10.1037/1076-8998.9.1.3>
48. Schwatka, N., Hecker, S., & Goldenhar, M. (2016). Defining and measuring safety climate: A review of the construction industry literature. *Annals of Occupational Hygiene*, 60(5), 537-350. <https://doi.org/10.1093/annhyg/mew020>
49. Seo, D. C., Torbai, M. R., Blair, E. H., & Ellis, N. T. (2004). A cross-validation of safety climate scale using confirmatory factor analytic approach. *Journal of Safety Research*, 35, 427-445. <https://doi.org/10.1016/j.jsr.2004.04.006>
50. Shannon, H. S., & Norman, G. R. (2009). Deriving the factor structure of safety climate scales. *Safety Science*, 47(3), 327-329. <https://doi.org/10.1016/j.ssci.2008.06.001>
51. Shea, T., De Cieri, H., Vu, T., & Pettit, T. (2021). How is safety climate measured? A review and evaluation. *Safety Science*, 143, 105413. <https://doi.org/10.1016/j.ssci.2021.105413>
52. Siu, O. L., Phillips, D. R., & Leung, T. W. (2004). Safety climate and safety performance among construction workers in Hong Kong: The role of psychological strains as mediators. *Accident Analysis and Prevention*, 36, 359-366. [https://doi.org/10.1016/S0001-4575\(03\)00016-2](https://doi.org/10.1016/S0001-4575(03)00016-2)
53. Teo, E. A., & Feng, Y. (2009). The role of safety climate in predicting safety culture on construction sites. *Architectural Sciences Review*, 52(1), 5-16. <https://doi.org/10.3763/asre.2008.0037>
54. Tetzlaff, E. J., Goggins, K. A., Pegoraro, A. L., Dorman, S. C., Pakalnis, V., & Eger, T. R. (2021). Safety Culture: A Retrospective Analysis of Occupational Health and Safety Mining Reports. *Safety and Health at Work*, 12(2), 201-208. <https://doi.org/10.1016/j.shaw.2020.12.001>
55. Wallace, J. C., Popp, E., & Mondore, S. (2006). Safety climate as a mediator between foundation climates and occupational accidents: A group-level investigation. *Journal of Applied Psychology*, 91(3), 681-688. <https://doi.org/10.1037/0021-9010.91.3.681>
56. Yule, S., Flin, R., & Murdy, A. (2007). The role of management and safety climate in preventing risk-taking at work. *International Journal of Risk Assessment and Management*, 7(2), 137-151. <https://doi.org/10.1504/IJRAM.2007.011727>
57. Zacharatos, A., Barling, J., & Iverson, R. D. (2005). High-performance work systems and occupational safety. *Journal of Applied Psychology*, 90(1), 77-93. <https://doi.org/10.1037/0021-9010.90.1.77>
58. Zhou, Q., Fang, D., & Wang, X. (2008). A method to identify strategies for the improvement of human safety behavior by considering safety climate and personal experience. *Safety Science*, 46(10), 1406-1419. Retrieved from <http://hdl.handle.net/102.100.100/119435?index=1>
59. Zohar, D. (2010). Thirty years of safety climate research: Reflections and future directions. *Accident Analysis & Prevention*, 42(5), 1517-1522. <https://doi.org/10.1016/j.aap.2009.12.019>
60. Zohar, D., & Luria, G. (2004). Climate as a social-cognitive construction of supervisory safety practices: Scripts as proxy of behavior patterns. *Journal of Applied Psychology*, 89(2), 322-333. <https://doi.org/10.1037/0021-9010.89.2.322>
61. Zohar, D. (2003). Safety climate: Conceptual and measurement issues. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of Occupational Health Psychology* (pp. 123-142). Washington, D.C.: American Psychological Association.
62. Zohar, D. (2002a). Modifying supervisory practices to improve subunit safety: A leadership-based intervention model. *Journal of Applied Psychology*, 87(1), 156-163. <https://doi.org/10.1037/0021-9010.87.1.156>
63. Zohar, D. (2002b). The effects of leadership dimensions, safety climate, and assigned priorities on minor injuries in work groups. *Journal of Organizational Behaviour*, 23(1), 75-92. <https://doi.org/10.1002/job.130>
64. Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on micro accidents in manufacturing job. *Journal of Applied Psychology*, 85(4), 587-596. <https://doi.org/10.1037/0021-9010.85.4.587>
65. Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and applied implications. *Journal of Applied Psychology*, 65, 96-102.