

Influence of Leadership Practices on Organizational Safety Performance

[http://doi.org/10.21272/bel.4\(2\).41-55.2020](http://doi.org/10.21272/bel.4(2).41-55.2020)

Adeshina Waheed Sadiq, ORCID: <https://orcid.org/0000-0002-4574-8421>

Doctor of Management, University of Phoenix, Arizona, USA;
Health Safety Security and Environment Manager, Oil and Gas Brunei Darussalam

Abstract

This study analyzes the reasons why leadership does not influence the counteraction to incidents (through the implementation of safety systems and technology), which cause serious injuries or deaths in US oil and gas companies. The modified Delphi method summarizes eight oil and gas industry experts' consensus on how leadership can reduce workplace incidents and improve organizational safety performance. The study selects eight safety specialists and leadership experts in executive positions in the US oil and gas industry, who participated in three rounds of discussions regarding the impact of leadership practices on the effectiveness of the safe conditions and were interviewed through a series of questionnaires. The study identifies five key aspects that can help improve the safety process efficiency in the company and provide the basis for future research: empowering employees to stop dangerous operations; formation of effective health, safety and environmental management system; employees' involvement in the formation of organizational safety initiatives, the creation of corporate culture in the company, the use of consistent behavior patterns in promoting safety improvements across the organization. The study concludes that preventing incidents and improving safety performance in an organization requires effective coordination of the five components, which, according to the experts' evaluations are the most important in terms of organization development. Therefore, leaders and practitioners in this field, who often face safety performance challenges, should apply a safety ecosystem approach to prevent incidents from occurring and improve safety performance within their businesses. The study results contribute towards a deeper understanding of how organizational management can apply existing knowledge on compliance with safe working conditions to prevent incidents in the company using different strategies to counteract them. The study identifies the main limitations related to the use of the modified Delphi method. They include the difficulties in determining the optimal sample size and attracting a sufficient number of study participants. The second limitation is that due to fewer participants, the conclusion from the study represents the views of the participants which may vary if a sufficiently large number of participants took part in the study.

Keywords: Incident Prevention, Leadership, Management System, Organizational Culture, Safety Culture.

JEL Classification: J28, J81, K32, M14.



This work is licensed under a Creative Commons Attribution 4.0 International License

Cite as: Sadiq, W.A., (2020). Influence of Leadership Practices on Organizational Safety Performance. *Business Ethics and Leadership*, 4(2), 41-55. [http://doi.org/10.21272/bel.4\(2\).41-55.2020](http://doi.org/10.21272/bel.4(2).41-55.2020).

© The Author, 2020. This article is published with open access at Sumy State University.

Introduction

Overview of the Issue. Workplace incidents continue to be a growing issue of concern across the globe. On average, about 2.3 million work-related deaths are recorded every year globally (Takala et al., 2014). In 2017, in the United States, a total of 5,147 number of work-related fatal injuries was recorded across all sectors. Besides, 882,700 workers sustained injuries that were severe enough to stay away from work for the entire workday (U.S. Bureau of Labor Statistics, 2019). Apart from the emotional and psychological impact of each workplace incident, the financial impact is sometimes very high. The advancement in safety and occupational health programs plus accident prevention through technology and engineering solutions and the use of safety management systems, including the application of human factor engineering, seems inadequate to prevent incidents that result in severe injuries (Robb & Miller, 2012). Reason (2016) explained that while human involvement in the design,

construction, maintenance, and operation of hazardous technologies makes human failures instead of technical failures the most probable causes of incidents at the workplace, however, it is important to understand how the combination of controls put in place by the organizational leadership may have confined the natural variability of human to act safely. Rodriguez, Bell, Brown, and Carter (2017) argued that to drive a significant improvement in an organization's process safety performance requires understanding the induced mechanisms that caused human failures to occur. These induced mechanisms are usually created by workplace conditions based on decisions made by organizational leadership.

Literature Review

There had been a few catastrophic incidents in history that redefined workplace occupational safety requirements. Such incidents spread across industries and countries. Few examples of such catastrophic events in history include Bhopal 1984, Chernobyl 1986, Piper Alpha 1988, Longford 1998, BP Texas 2005. Lack of effective leadership has been identified as a common contributory factor to all the incidents. In 2011, McBride and Collinson concluded from a review of three process safety incidents in 2005 (BP Texas in the US, THORP in the UK and Buncefield Oil depot incident the UK) that leadership failure, lack of management oversight, poor safety culture, inadequate or absence of safety monitoring, defective equipment, change resistance, dilemma or incompatible goals, and unsafe acts or unsafe conditions are the common causes of these three incidents. From 2005 to 2018, there had been several high-profile incidents that resulted in both losses of lives and asset damage, the climax of which was the deep-water horizon incident in 2010 that resulted in the loss of 11 personnel with over \$70 billion-dollar cost on asset and litigation (U.S. Chemical Safety Board, 2018). Researchers argued that incidents usually occur because of a complex web of causal factors like the state of the work environment, systemic failures, human errors, and failure of equipment (Dodge, 2012; Lin, 2012; McBride & Collinson, 2011). Despite the identification of causes of incidents, there are no industry best practices for preventing incidents because not all the root causes can be addressed with the use of technology, processes, and or management system. Pillay (2015) explained that the effectiveness of many of the accident causation models and safety management systems remain questionable because many of the tools may have been outpaced by the rapid technological advancements which make such tools and strategies inadequate for present modern-day high paced technology environment. A study conducted by de Vries, de Koster, and Stam (2016) concluded that organizations cannot depend solely on technical solutions to address the safety accidents that do happen at the workplace. Instead, a combination of efforts targeted at creating a vibrant safety culture, addressing safety climate conditions, and promoting safety consciousness would be required. Like de Vries et al., Pillay (2015) argued that a re-thinking of accident causation and safety management; that includes an integrative theoretical framework that considers the multi-disciplinary nature of safety management may be the logical steps at advancing the accident prevention and safety management agenda. McBride and Collinson's (2011) opined that improving organizational safety performance requires addressing all causes of incidents at the workplace which include systemic, processes and people-related issues. Each identified causes of accident require different leadership approaches and behavior to proactively prevent accidents from happening. This research study contributes to narrowing the gap in the literature on the evolving subject of the influence of leadership on employee safety behaviors by exploring the interplay of the three elements of leadership, safety culture and safety climate as denoted in Fig 1. below.

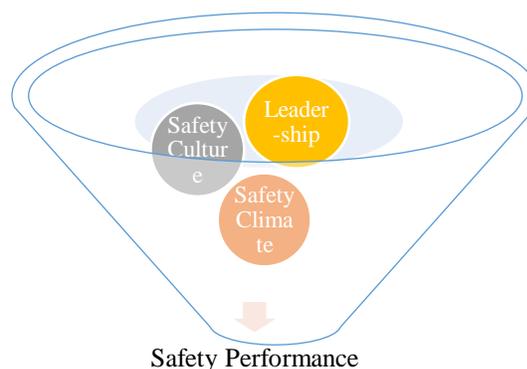


Figure 1. The Interplay of Leadership, Safety Culture and Safety Climate on Safety Performance

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Research Questions. The key elements from the research questions are leadership practices, work climate, workplace culture and how these elements transform into organizational safety performance. The research questions served as the reference point for developing the research instrument that was used in exploring answers to the two research questions.

RQ1 – How do leaders in the oil and gas industry through their practices create a workplace culture that prevents serious injury or fatality incidents?

RQ2 – What leadership practices promote safety performance in an oil and gas organization?

Theoretical Framework. The theoretical framework for this study synthesized transformational leadership theory, and incident causation theory and the link with worksite culture, worksite climate, and organizational performance outcomes. Using figure 2.0 as a reference, this study focused on the contemporary leadership theoretical construct to establish practices that promote the prevention of incidents and injuries at the oil and gas industry worksites. The study also explored the theoretical construct that supports the creation of work climate and worksite culture that promote improved safety performance. Organizational leadership through their actions or inactions, define and create the workplace environment and culture, which the employees rely on, to determine appropriate and acceptable actions and expectations.

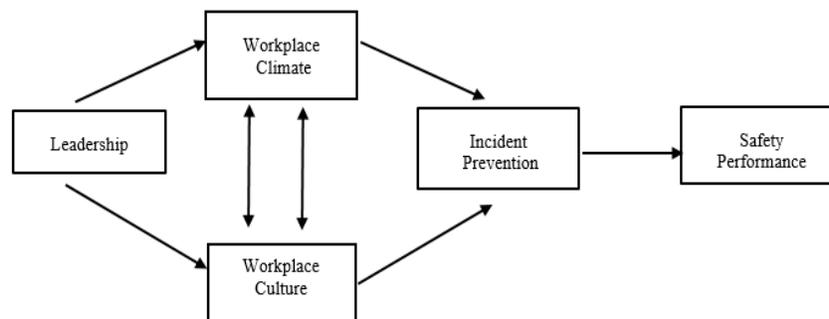


Figure 2. Theoretical Framework of Leadership Practices on Safety Performance

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Purpose. The purpose of the modified Delphi study was to gain consensus of oil and gas industry experts and safety practitioners on leadership practices that may influence the safety performance within the oil and gas industry. These leadership practices were then translated into recommendations which the leaders may use as incident prevention framework or incorporate into their HSE management system to prevent incidents and improve their organization’s safety performance.

Methods

Research Design. The study design identified the strategies adopted to gather data required for interpretation and analysis. The modified Delphi method was selected for this research due to the flexibility associated with screening, recruitment of experts and facilitation of the Delphi rounds using a web-based online platform. Composed of eight diverse experts with safety knowledge in leadership positions and safety professionals in the oil and gas industry in the United States, the experts engaged in three rounds of discussions regarding the influence of leadership practices on safety performance using sequential questionnaires. At the end of three rounds of discussions, the experts achieved a consensus of opinions on the leadership characteristics that may influence organizational safety performance.

Population and Sample. Participants for this research study were selected from a population pool of oil and gas workers in the United States. The key characteristics for the population include being employed in the United States’ oil and gas industry with a minimum of three years industry experience, and or safety professional qualification with the Board of Certified Safety Professionals (BCSP).

Recruitment of Participants. Using a purposeful sample process, invitation letters containing a brief description of the study, demographic form, and the researcher’s contact details letters were sent to potential participants from

the oil and gas industry requesting for expression of interest to participate in the research study. Those that expressed interest to participate as modified Delphi panel experts were screened based on their experiences, qualifications and knowledge of the research questions. Figure 3 represents the flow chart for conducting the research study using a modified Delphi method. The study instrument was developed using themes extracted from the review of literature based on the research questions. The face validity of the instrument was tested through a field test outside of the research setting after obtaining approval from IRB to proceed with the study.

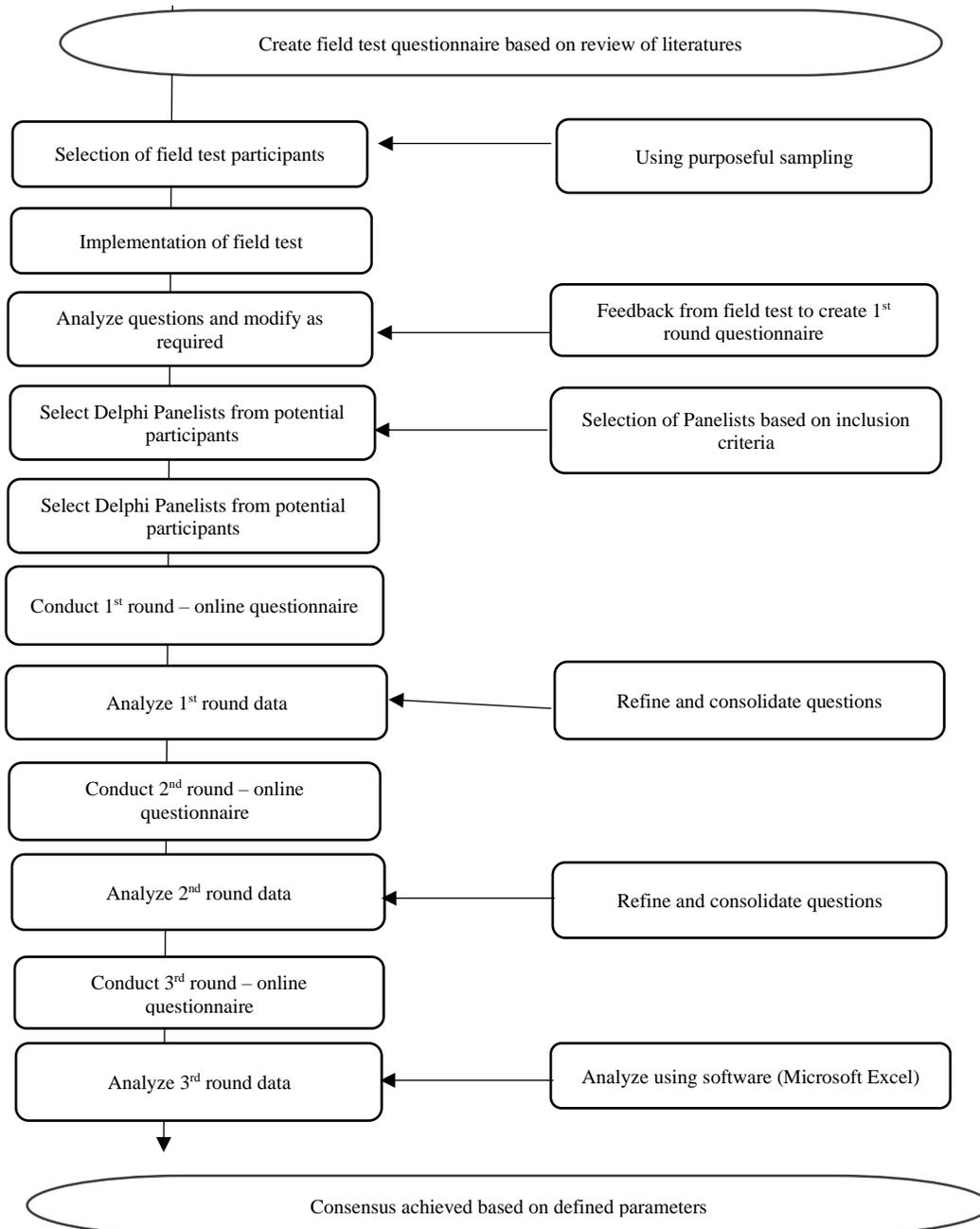


Figure 3. Modified Delphi Method Implementation Flow Chart

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Field Test. The field test participants were selected based on their oil and gas experience and knowledge of safety policies, rules, and procedures. The number of participants for the field test was pegged at five. The purpose of the field test was to assure the understanding and quality of the questionnaire about the research topic. Data was

not collected during the field test, but the responses from the field test participants were used in finetuning the instrument for the actual modified Delphi rounds.

Data Collection. For this study, the panelists were provided with a list of questions based on the validated research instrument. The data collection process involved three rounds with interspersed feedback to panel members in between. The instrument was sent to all panelist via survey monkey software. The panelists were provided with passwords for each round. Panelists were given up to two weeks to complete their questionnaires.

Round One. Participants were asked to complete the online consent form which, was the first page of the online survey before being able to take part in the study. The participant had the flexibility to withdraw their consent anytime during the study. Round one started with a list of theme-based questions created from the review of literature on the research topic and validated through a field test (see figure 4.0). Round one questionnaire comprised of twenty open-ended questions and three scenario-based questions aimed at generating ideas from the panelists regarding safety management systems, safety performance measurement, cultural factors, work climate, leadership practices, incident prevention techniques, and managing workplace dilemma situations.



Figure 4. Themes used for developing round one survey questions based on literature review

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Round Two. Round two questionnaire contained a list of responses on leadership practices that the experts identified in the first round could contribute towards the reduction of incidents and improve organizational safety performance. These responses were content analyzed, and similar statements grouped to reduce repetition without losing the meaning of their responses. Each panel member was asked to rate the round one's responses in order of importance using a Likert scale of 1-5. Where there was a consensus of the panel members on a question, that question was removed from the subsequent rounds.

Round Three. Responses from round two were analyzed and used to create the questionnaire for round three. Statements in round two that the experts achieved a consensus of greater than 70% were removed from the round three statements. During round three, the panelist had the opportunity to adjust their responses to round two's statements, and they were able to see other panel members' responses to round two statements. The third round required the panelists to converge on the top responses from round two. The panelists were asked to rate the responses from round two using a Likert scale rating of 1-5.

Data Analysis

Round One Analysis. At the end of round one, responses from the modified Delphi panelist were analyzed for content as follows:

1. Identified statements that are similar or that have the same meaning;
2. Grouped the statements into themes and subthemes;
3. Identified unique statements and included as part of round two surveys;
4. Used the themes and the responses from round 1 to generate the questionnaire for round two.

Round Two Analysis. At the end of round two, responses from the panelist were analyzed using Microsoft Excel to calculate the statistical analysis to determine the measure of central tendencies (mean, mode, median) and dispersion. The consensus value for each statement was set at 70% agreement by the experts on each statement in round two. Questions that the panelists were not able to arrive at a consensus in round two were included in round three.

Round Three Analysis. Round three involved the experts reviewing their ratings of the statements from round two in which there was no consensus. The experts had the opportunity to compare the individualized rating of each statement to the average rating of the same statements by the panel of experts. At the end of the modified Delphi rounds, the experts achieved agreement on nineteen statements from rounds two and three. Microsoft Excel was used in calculating the descriptive statistical parameters of mean, median, and deviation for the ratings of each of the statements in the Round three survey to establish which statements achieved consensus.

Results

Demographics. The demographic distribution of the experts is presented in Table 1 below. The study participants are experienced oil and gas employees in senior leadership position or safety roles. Six of the participants work for one of the four leading multinational oil and gas companies in the United States. One of the participants works for an oil and gas risk consulting firm, and another participant works for a petrochemical plant. One participant is the owner of a safety consulting firm. The study participants have 186 years cumulative oil and gas experience. Individual industry experience ranges between 7 and 40 years. The age bracket of the participants is between 35 to 65 years. All the participants have bachelor’s degrees in different fields, with seven out of the nine participants holding additional Graduate degrees.

Table 1. Participant Demographic Summary

Panellist Code Identifier	Job Title	Education	Age Bracket	Experience in Oil and Gas	Professional or Safety Designation	Gender
SLP01	Principal Consultant / Vice President of Manufacturing	M.Sc.	55-65	40		Male
SLP02	Global Safety Culture Expert and Sr. Vice President	Masters	55 -65	20		Male
SLP03	VP HSE and Engineering Authority	B.Sc., M.Sc. and PhD	45-54	19		Male
SLP04	Manager, HSSEQ & Risk Mgt	B.Sc, and M.Sc.	45-54	20		Male
SLP05	Well Engineer	B.Sc.	35-44	17	SPE	Male
SLP06	Principal Consultant / General Manager, Operational Excellence	BSc.	55-65	16	ASPP	Male
SLP07	Owner and Operator	M.Sc.	45-54	12	CSP	Male
SLP08	General Manager HSE	B.Sc. and Masters	55-65	35		Female
SLP09	Senior Safety Engineer; Stewardship Leader	B.Sc. and M.Sc.	35-44	7	CSP	Female

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Round One Analysis. The first round resulted in an 88.9 % response rate. Four themes emerged after conducting a content analysis of the responses received from the experts at the end of round one. Similar responses were consolidated to minimize repetition without losing their original meaning. The themes were further analyzed in the context of the research questions.

Theme one: Safety management system: Responses from the experts confirmed a need for organizational leadership to establish a process-based system for continuous management of safety. 77.8 % of the experts believed that the success of a safety management system is underpinned by the organizational leadership commitment towards its implementation. 88.9% of the experts stated that typical leaders' actions and practices may include regular engagement with the workers, clear communication of safety expectations, reinforcement of positive safety behaviors, and a visit to the field or shop floor where the work or activities are happening. 88.9% of the experts opined that leaders should promote ownership and accountabilities of safety performance across all the levels of the organization. According to SLP 02, promoting ownership and accountabilities across any organization is 'table stakes' without which the organization's effort at improving safety performance will fail". SLP 02 explained further that the critical components needed to promote ownership and accountabilities of safety are visible and felt leadership, effective management review, and steering committee leadership. The experts believed that the effectiveness of safety management is assured when the safety processes and programs result in the needed improvement on safety performance. Organizational leaders are advised to put in place clear safety performance metrics to ensure the effectiveness of the safety management system.

Theme two: Strengthen organizational culture: The experts explained that organizational leaders should put in place the necessary support system or process that promotes compliance with safety rules, work practices, and procedures. Organizational leaders are required to build and strengthen their organizational safety culture through their actions and practices. SLP 04 challenged organizational leadership to provide employees with the right tools and create an environment that allows safety excellence to thrive. Leaders should create an atmosphere of trust and openness, including empowering employees, to stop all unsafe acts. Leaders are encouraged to explore practices that prevent at-risk behaviors and unsafe conditions.

SLP 06 advised leaders to anticipate that people will make mistakes due to human performance. Recognition of this human performance gap facilitates the predictability of error-likely situations. The expert advised that organizational leaders should design systems and the organization to be error-tolerant, resilient, and recoverable. SLP 03 challenged leaders to promote reporting culture among employees through transparent, rewards and recognition programs and simplification and standardization of systems. Creating a safe work environment requires organizational leadership to promote a culture devoid of fear of blame or punishment. In addition to creating a safe work environment, leaders are encouraged to advocate employee participation and involvement through demonstration of transparency, trust, and openness.

Theme three: Embark on incident prevention strategies: All the experts advised leaders to conduct regular employee engagements on safety across all levels of the organization, including field visits to the shop floors. These regular engagements may foster and strengthen the relationship between the leaders and the employees. Organizational leaders are challenged to promote a learning culture across the organization by investigating incidents and reflecting on the successes of the organization. SLP 01 and SLP 02 challenged leaders to always seek to learn by proofing this in their actions. Leaders should show their employees how learning is used to improve things that matter to them. Engaging employees in learning from incidents and near misses are essential for continuous improvement of the organization. Leaders are advised to audit learnings for completeness and to ensure that learnings are applied and integrated into training, work procedures, and audit procedures. SLP 08 encouraged organizational leaders to reward full reporting and role model the behavior by reporting all incidents themselves. SLP 06 explained that leaders could either choose to learn and improve from incident or blame and punish. However, it is more beneficial for leaders to promote a culture where employees feel they can report issues and concerns without reprisal.

Theme four: Leverage the use of technology: SLP 08 explained that the use of technology is critical for an organization to make a cultural shift. Organizational leaders are advised to use to amplify weak signals and to strengthen muscle memory that will help people better respond to failure. SLP 04 believed the use of technology would encourage innovation and creativity. 62.5% of the experts advised that the use of technology would aid incident reduction through real-time visualization of system status, equipment out of service, equipment isolations, reduction of human error, de-risking operations, the development of practical self-verification tools and limiting employee exposure.

Round Two Analysis. Round two questionnaire was developed using the expert responses from Round one (see table 2). The consensus rating for this study was preset at 70%. The percentage of consensus was determined by the number of experts that gave a similar rating to each statement. Besides, the statement that recorded experts' median Likert scale rating of 1 or interquartile range (IQR) of between 0 and 0.25 is deemed to achieve consensus. The Likert scale rating of 1 in the study represents 'very important' rating. The experts achieved consensus on 11 out of the 99. Achieving a value of equal to or greater than 70% consensus or median of 1 or interquartile range (IQR) of between 0 and 0.25 meant that the panel of experts agreed that the statement is very important.

The statement number 1 on “design and implement a fit for purpose process-based HSE management system” was rated by 87.5% of the panel of experts as very important while the remaining 12.5% expert rated it as important. Seventy-five per cent of the experts rated statement number 6 “demonstrate leadership commitment to the organizational vision, values, and strategic objectives and encourage your employees to do the same” as very important, and 25% rated the same statement as important.

Similarly, 75% of the experts rated statements 8, 12, 24, 35, 41, 44, 62, and 76 as very important while the remaining 25% of experts rated statements 8, 12, 24, 35, 41, 44, 62 and 76 as important. All the experts rated the statement number 25 “empower employees to stop all unsafe acts” as very important. At the end of round 2, the experts achieved consensus of >70% on 11 out of the 99 statements. Reliability and internal consistency of the Round two data were established by calculating the Cronbach alpha (α) value. Round two data achieved a reliability (α) value of 0.97387.

Table 2. Round 2 Survey Statements

No	Statements
1	Design and implement a fit for purpose process based HSE management system.
2	Conduct safety assurance (audits and inspections) to ensure the effectiveness and continuous improvement of the HSE management system.
3	Establish management system, cultural boundaries, leadership expectations, and system discipline.
4	Implement Behavior-Based Safety Observations.
5	Promote Incident Reporting and Investigate all incidents and near misses to extract learnings.
6	Demonstrate leadership commitment to the organizational vision, values, and strategic objectives and encourage your employees to do the same.
7	Conduct regular engagements with the employees, GEMBA walk and field visits.
8	Communicate clear expectations to all employees.
9	Apply different communication strategies and styles for different audiences.
10	Make all levels of the organization accountable for safety performance and include as part of their annual performance appraisal
11	Incorporate “safety mindset” at the forefront of discussions, meetings and decisions.
12	Model safety behaviors that you expect from the employees; like field visits, regular engagements, right to stop unsafe act, or unsafe situation as this would stimulate ownership & accountability across levels.
13	Conduct safety management and accountability reviews.
14	Set up the leadership steering committee to address safety issues and dilemmas.
15	Reinforce safe behaviors, establish and communicate criteria for reward and recognition to all employees.
16	Reward transparency, continuous improvement and those who leverage learnings from others.
17	Implement performance-based gap analysis and assessment of strategies, processes and activities used to manage and control risks.
18	Develop and implement leading performance metrics that focus on - # of employee engagements, field visits, personal, process safety, and preventive reliability activities.
19	Track and verify % complete action items from audits and investigations.
20	Measure and communicate about leadership engagements and walkabout.
21	Establish and reinforce a safe reporting culture, observation cards, audits, etc.
22	Create and promote a safe work environment by combining a fit for purpose process-based management system and highly engaged leaders
23	Empower employees with the right competencies and the right tools to create an environment that allows safety excellence to thrive.
24	Encourage employee participation and involvement through demonstration of transparency, trust, and openness.
25	Empower employees to stop all unsafe acts.
26	Demonstrate visible commitment to safety by participating in key safety activities like risk assessments, HAZOP, management system reviews etc.
27	Ensure safety rules, policies, work practices, and procedures are simple, easy to understand and fit for purpose to promote compliance.
28	Demonstrate care for people by engaging through their hearts and minds.

Table 2 (cont.). Round 2 Survey Statements

29	Encourage learning from both successful work activities as well as incidents.
30	Seek to understand the barriers and dilemmas faced by workers (such as time pressure, resource constraints, competency issues, etc.).
31	Establish boundaries and apply consequences to enforce discipline.
32	Empower different level of the organization to conduct assurance (layered audits) on the safety systems.
33	Understand the hazards at the workplace and ensure the right controls are in place.
34	Leaders should encourage and positively recognize workers who bring up concerns (and especially solutions) that will help avoid or prevent serious Health Environment and Safety issues and incidents.
35	Promote a just culture, and champion a blame-free policy where employees can report errors or near misses without fear of reprimand or punishment.
36	Encourage anonymous reporting and put in place a process for correcting unsafe behavior including follow up.
37	Approach incident investigation from a systemic failure viewpoint, instead of a worker failure; to understand the system issues that led to the incident.
38	Leader response to failure may affect organizational safety performance.
39	Establish communication protocol to address language barriers, and different work groups within the organization.
40	Design systems and processes to be resilient, reduce errors and recoverable.
41	Connect with the frontline as this is probably the most powerful tool in shaping a safety culture
42	Demonstrate consistent set of leadership behaviors to influence and shape the organization culture
43	Be just and hold people accountable to follow processes and procedures.
44	Walk the talk and avoid a say/do gap
45	Create a learning culture by seeking out/implementing learnings from internal (successful work as well as incidents and near misses) and external best practices.
46	Audit learnings for completeness and integrate learning into training.
47	Engage everyone and demonstrate that they are very important to the success of the enterprise.
48	Promote open communication and constructive feedback
49	Extend engagement to employees and the contractors' workforce
50	Leverage technological innovation for barrier management
51	Implement robust training and safety protocols
52	Get out of the office and spend most of their time with the people at the frontline
53	Listen closely, and help employee improve, coach them and break down barriers to improvement.
54	Clearly communicate expectations on safety during hiring or recruitment.
55	Clear safety training programs for all employees and contractors
56	Promote employee engagement led safety walks
57	Guard the trust relationship between you and employees
58	Demonstrate that you care about the employees.
59	Allow the frontline to develop programs that help to drive safety culture
61	Trust encourages co-operation, commitment to company safety policy
62	Promote trust by engaging with people, listening to them, displaying genuine empathy, getting to know them as people, taking their input seriously and acting on it.
63	Be humble and make it safe for people to approach you.
64	Encourage two-way accountability discussions by promoting self-reporting of field visits
65	Encourage open communication, remove barriers to communicating on safe work practices
66	Empower people to use technology in experimenting and developing new tools that may help reduce risk.
67	Use technology to de-risk operations and limit exposure.
68	Empower employees to use technology for the development of practical self-verification tools.
69	Align use of technology with human capital rather than replace human capital.
70	Leverage use of technology to help people conduct safety audits, management of change to reduce human error and increase consistency.
71	Use technology to make information available to workers through real time visualization of system status, equipment out of service, equipment isolations, etc.
72	Use technology to amplify weak signals and to strengthen muscle memory that will help people better respond to failure.
73	Develop and implement strong layered audits to ensure effectiveness of the management system.
74	Leader must engage, allow for constructive criticism and feedback, and promote training & awareness.
75	Be confident but humble, display integrity and the organization know you will keep your word.
76	Leading by example, taking responsibility when things go wrong and sharing the credit when things go well.
77	Demonstrate that you don't know everything, and you are always open to learning.
78	When an incident happens, recognize your response matters - focus on how to help, recover and learn instead of on blaming and punishing those involved.

Table 2 (cont.). Round 2 Survey Statements

79	Mentor new workers to ensure they understand and implement safe working practices.
80	Look for every opportunity to take decisive action to prove priority of safety over production.
81	Clarify the dilemma and expected outcomes for production vs. protection (safety).
82	Implement competency assurance framework and incorporate clear safety responsibilities into employees' job description.
83	Celebrate when actions are taken that demonstrate when leaders and workers put safety over production.
84	Work with Production Leadership to establish the safety fundamentals. Communicate with the staff the expectation of all regarding these fundamentals and then hold everyone accountable to deliver on these fundamentals.
85	Engage relentlessly - every shift, every day to be sure the processes are being used right.
86	Listen to people, respect what they have to say and act.
87	Drive engagement, processes, and stamp out punishment.
88	Engage employees with golden rules of safety to simplify expectations for production vs. protection (safety).
89	Embark on hearts and mind program to get employees engaged.
90	Engagement of the workforce to help develop safety themes that resonates with hearts and minds.
91	Implement competency assurance programs across board.
92	Promote regular safety reviews, minimum reporting standards set by line management, safety campaigns based on past incidents.
93	Get the leadership team out in the facility to communicate priorities, demonstrate visible leadership behaviors, and to start understanding workers issues, dilemmas, and the barriers to performing work.
94	Work with each asset leader to develop clear action plans to close out critical gaps that can be seen and felt by the front line.
95	Invest in developing subconscious risk-based decision-making training.
96	Establish a process to engage front line leaders/supervisors and middle managers.
97	Implement leading and lagging indicators that are broadly communicated to the workforce and rigorously tracked.
98	Measure company's safety programs performance against industry criteria and adjust accordingly (bench marking).
99	Develop a transparent performance management system to ensure that real progress is made.
100	Test the effectiveness of management system with the front line that is impacted by the safety processes and programs.

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Round Three Analysis. Eighty-eight statements that did not reach a consensus level of 70% in Round two were represented to the panel of experts for reassessment in Round 3. At the end of Round Three, the panel of experts achieved consensus only in eight out of the 88 statements. The experts achieved consensus on these additional statements because some of the experts made changes to their Round two ratings of the same statements. It is interesting to note that while most of the experts revised their ratings upward (from important to very important), few of the experts revised their ratings downward. At the end of rounds two and three, the experts achieved consensus on 19 out of 99 statements. The statistical mean (\bar{x}) value of each of the 19 consensus statements was calculated for ranking each statement in order of importance. All the experts agreed that it is 'very important' for organizational leadership to empower employees to stop all unsafe acts. 87.5% of the experts agreed to the statement that organizational leaders should design and implement a fit for purpose process-based HSE management system. To ensure the effectiveness of the HSE management system, 87.5% of the experts agreed that organizational leadership should set and communicate clear leadership expectations and cultural boundaries to all employees to promote system discipline. Table 3 provides a summary of the statements which the experts achieved consensus on both in Rounds two and three.

Table 3. Consensus statements ranked in order of importance at the end of the study

S	Statements	Mean	Median	Inter-quartile range	Q1	Q3	Consensus Rating $\geq 70\%$
25	Empower employees to stop all unsafe acts	1	1	0	1	1	100.00
1	Design and implement a fit for purpose process-based HSE management system.	1.13	1	0	1	1	87.50
3	Establish management system, cultural boundaries, leadership expectations, and system discipline.	1.13	1	0	1	1	87.50
37	Approach incident investigation from a systemic failure viewpoint, instead of a worker failure; to understand the system issues that led to the incident.	1.13	1	0	1	1	87.50
92	Get the leadership team out in the facility to communicate priorities, demonstrate visible leadership behaviors, and to start understanding workers issues, dilemmas, and the barriers to performing work.	1.13	1	0	1	1	87.50

Table 3 (cont.). Consensus statements ranked in order of importance at the end of the study

6	Demonstrate leadership commitment to the organizational vision, values, and strategic objectives and encourage your employees to do the same.	1.25	1	0.25	1	1.3	75.00
8	Communicate clear expectations to all employees	1.25	1	0.25	1	1.3	75.00
12	Model safety behaviors that you expect from the employees; like field visits, regular engagements, right to stop unsafe act, or unsafe situation; as this would stimulate ownership & accountability across levels.	1.25	1	0.25	1	1.3	75.00
22	Create and promote a safe work environment by combining a fit for purpose process-based management system and highly engaged leaders	1.25	1	0.25	1	1.3	75.00
24	Encourage employee participation and involvement through demonstration of transparency, trust, and openness.	1.25	1	0.25	1	1.3	75.00
35	Promote a just culture, and champion a blame-free policy where employees can report errors or near misses without fear of reprimand or punishment.	1.25	1	0.25	1	1.3	75.00
41	Connect with the frontline as this is probably the most powerful tool in shaping a safety culture	1.25	1	0.25	1	1.3	75.00
42	Demonstrate consistent set of leadership behaviors to influence and shape the organization culture	1.25	1	0.25	1	1.3	75.00
61	Promote trust by engaging with people, listening to them, displaying genuine empathy, getting to know them as people, taking their input seriously and acting on it.	1.25	1	0.25	1	1.3	75.00
62	Be humble and make it safe for people to approach you.	1.25	1	0.25	1	1.3	75.00
75	Leading by example, taking responsibility when things go wrong and sharing the credit when things go well.	1.25	1	0.25	1	1.3	75.00
77	When an incident happens, recognize your response matters - focus on how to help, recover and learn instead of on blaming and punishing those involved.	1.25	1	0.25	1	1.3	75.00
85	Listen to people, respect what they have to say and act.	1.25	1	0.25	1	1.3	75.00
44	Walk the talk and avoid a say/do gap	1.38	1	0.25	1	1.3	75.00

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Discussion. The study explored experts' opinions on the leadership practices that may influence an organization's safety performance. At the end of the study, the experts achieved consensus on 19 out of the 99 statements generated from responses to the research instrument in round one. The mean value of each of the consensus statement was determined for the ranking the consensus statements in order of importance (Habibi, Sarafrazi, & Izadyar, 2014). The five highest-ranked statements were identified as the final themes of study while the remaining 14 statements were merged into the five themes as enablers. Figure 5.0 represents the five themes that emerged at the end of the study. The five themes that emerged from the panel of expert's consensus statements are discussed below.

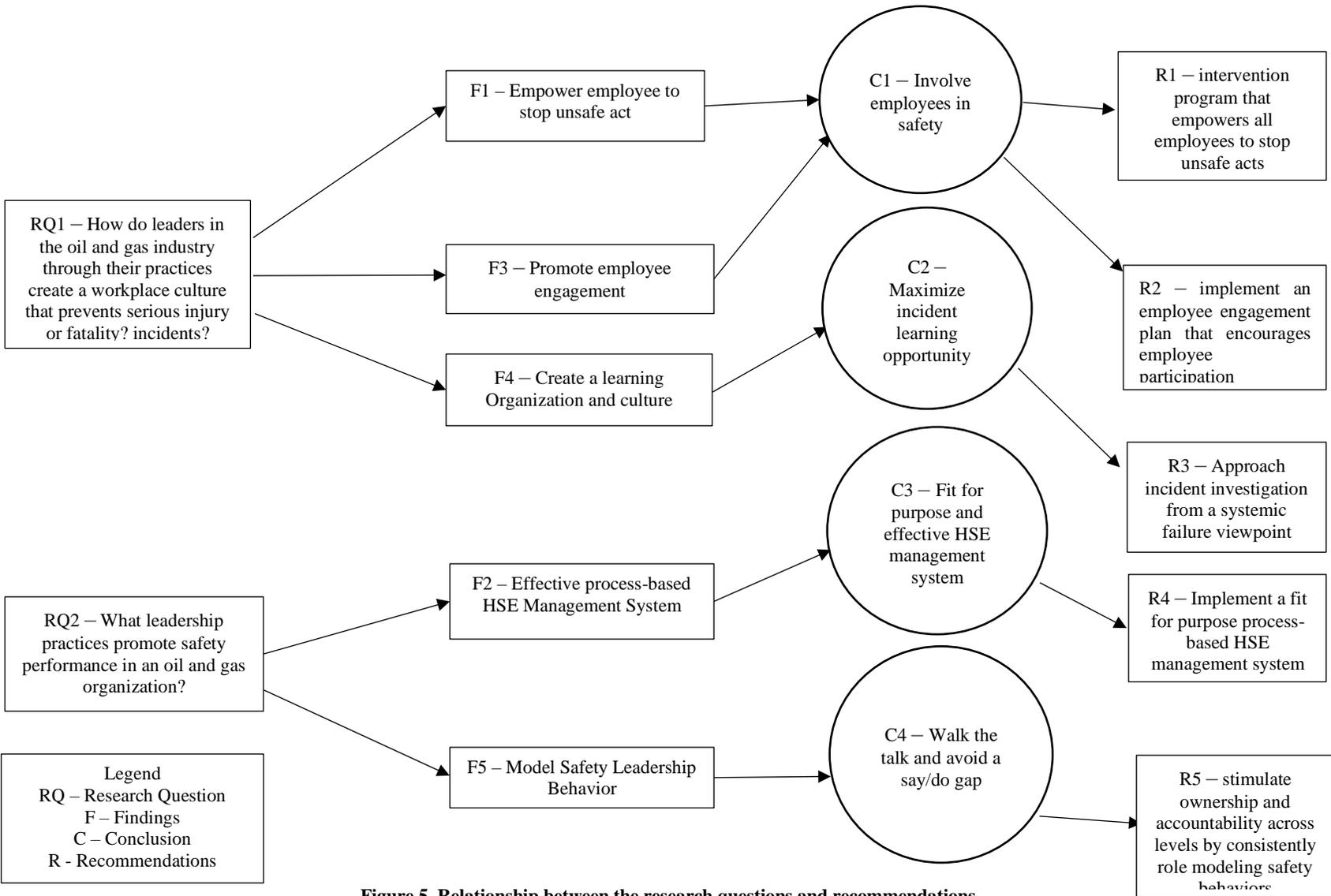


Figure 5. Relationship between the research questions and recommendations

Source: Sadiq, A. W., 2020, Influence of Leadership Practices on Organizational Safety Performance, *Doctoral dissertation*, University of Phoenix, USA

Theme One: Empower Employees to Stop All Unsafe Acts (100% Consensus). The experts, after three rounds of iteration, unanimously agreed to the statement that employees must be empowered to stop all unsafe acts as this would be the first step towards incident prevention. 75% of the experts agreed that part of the process of empowering employees to act safely and stop all unsafe acts include the organizational leadership encouraging involvement and participation of employees in the management of safety and demonstration of transparency, trust, and openness. Heinrich reported a study conducted in 1931 that most accidents are caused primarily by the unsafe acts of workers, and there exists a causation path between an injury and near miss. Heinrich's accident causation theory helps to promote a proactive approach to injury prevention by focusing on unsafe conditions and behaviors with the hope of learning from them before they result in injuries (Lin, 2012).

Hofmann, Burke, and Zohar (2017) had emphasized the critical components of worker's safety and productivity as being able to determine the worker's capability, emotional condition, and the effect of the work environment on the worker. The experts identified empowering the employee to stop unsafe acts as the most important step towards incident prevention and safety improvement. The literature review and the above finding indicate that organizational leadership should create a psychologically safe work environment and provide the necessary support to empower employees to be able to speak up and stop unsafe acts or conditions without any fear. Organizational leadership that empowers their employees have a direct positive impact on the employees' job satisfaction, commitment, and performance (Amundsen & Martinsen, 2015).

Theme Two: Effective Process-Based HSE Management System (87.5% Consensus). The second most ranked findings by the experts is that organizational leadership should put in place a fit for purpose process-based HSE management system. Establishing an effective safety management practices is essential to drive incident reduction and safety improvements (Shamaii, Omidvari, & Hosseinzadeh Lotfi, 2016; Wachter & Yorio, 2014). 87.5% of the panel of experts agreed that organizational leadership must establish a process-based HSE management system. Wells (2015) identified five key elements from general management principles that if properly implemented by organizations would create a progressive safety culture. The key elements are leadership, clear responsibilities and accountabilities, clear expectations and directions and ethical consideration and compliance. 75 % of the experts agreed that the key elements identified by Wells underpin the effectiveness of the organization's HSE management system.

Theme Three: Promote Employee Engagement (87.5 % Consensus). Another important finding of this study was the need for organizational leadership to engage regularly with the employees. Idris, Dollard, and Tuckey (2015) described employee engagement has a beneficial process for both the employer and the employees. The employees derive happiness and the perception that 'work' as a critical part of life experiences is enjoyable. 87.5 % of the experts agreed to the statement that organizational leadership should engage the workforce regularly at the frontline where activities take place, to communicate priorities, demonstrate visible leadership behaviors, and to start understanding workers' issues, dilemmas, and the barriers to performing work safely. The leaders engaging regularly with the employees would create an avenue to communicate their safety priorities, promote the involvement of the employees and positively influence employee perception of priority of safety (Nahrgang, Morgeson, & Hofmann, 2011; Mullen, Kelloway, & Teed, 2017). The panel of experts believed that through these engagements, the leaders would be able to establish trust with the employees, listen to them, display genuine empathy, getting to know their employees as people, taking the feedback received from the employee seriously, and acting on it. Key benefits of leadership regular engagement with the employees include more significant involvement of employees in health safety and environment discussion and improving the confidence level of the employees to be responsible for their safety (Nahrgang, Morgeson, & Hofmann, 2011). Apart from earning the trust of the employees and promoting employee involvement in safety affairs, regular employee engagement eliminates barriers between management and employees, including strengthening the relationship between the two stakeholders of the organization. When it comes to incident prevention, everyone has a critical role to play either as a leader or as an employee.

Theme Four: Create a learning organization and culture (87.5 % consensus). The experts identified learning as a critical element of promoting a safe work environment and a positive safety culture. 87.5% of the experts agreed that organizational leadership should approach incident investigation from a systemic failure viewpoint, instead of a worker failure. Adopting a systemic approach to the incident investigation would ensure maximum learning experience for the organization. Smith (1999) argued that incidents are usually caused due to the failure of the element(s) of the organization's management system. As a result, the worker should be involved in fixing the failed elements rather than been blamed as the main cause of the incident (Smith, 1999: 5).

Learning from incidents should not be restricted to the organization's internal incidents, some of the experts believe that leaders should create a learning culture work environment by seeking out and implementing

learnings from internal (successful work as well as incidents and near misses) and external best practices. The experts believed that one of the ways of building a sustainable learning culture is through the involvement and participation of employees and the demonstration of transparency, trust, and openness. Workers attitude towards safety is usually developed and nurtured by the workplace context and past experiences. Achieving a safe working environment requires organizational leadership to use management policies and leadership behavior to shape the safety climate of the workplace and employee risk perceptions.

Theme Five: Model Consistent Safety Leadership Behaviors (75.00% Consensus). The consensus by the experts that organizational leadership should, through their actions and behavior reflect what they expect from their employees align with the study conducted by Mullen, Kelloway, and Teed (2017). Mullen et al. (2017) asserted from their study that there exists a relationship between employer safety obligations and safety performance, behavior, compliance and attitudes of employees. Krause, Groover, and Martin (2010) opined that the employees would perceive higher levels of safety when organizational leadership focus and lay more emphasis on safety. Organizational leadership, through their actions, help form the employee perception that drives employees' behavior. Bosak and Cullinane (2013) explained that employees' perception of safety at the workplace is influenced by the way organizational leadership reacts to and handles safety concerns and or safety discussion at the workplace. Organizational leadership, through their actions, help form the employee perception that drives employees' behavior. The defining moment for organizational leadership is how they act when employees are faced with dilemma situations like pressure for high production and safety at the plant. The conclusion from the study is that the oil and gas industry leaders and practitioners faced with safety performance challenges may apply a safety ecosystem approach to preclude incidents from occurring and improving the safety performance within their businesses. The safety ecosystem in the context of this study refers to the establishment of an effective safety management system that supports a work climate condition that allows for employee participation and engagement and promotes a safety culture built on trust and openness. Organizational leadership may be able to mitigate safety performance challenges in their organization, by putting in place a proportionate blend of the five themes ranked as most important for safety excellence to thrive.

Implication of Study

This research may provide Government regulators, safety professionals, leaders, and other stakeholders in the oil and gas industry with the knowledge to apply multifaceted leadership practices to prevent incidents and injuries at their workplaces. The study was consistent with the research methodology and theoretical framework adopted for the study. Improving an organization's safety performance is synonymous with preventing incidents that could result in major injury or fatality.

Recommendations for Future Research

This study explored the interplay of culture, work climate, and safety leadership in the drive towards achieving an incident-free, high performing organization using a modified Delphi methodology. The first recommendation for future studies is to consider the use of a larger sample size to mitigate limitations that may be associated with the use of small sample size. Another recommendation for future studies is to consider the use of other research methodologies in other high-risk industries.

Acknowledgements

The author thanks the Center for Educational and Instructional Technology Research, College of Doctoral Studies, University of Phoenix, for supporting the preparation of this article.

References

1. Amundsen, S & Martinsen, L. (2015). Linking empowering leadership to job satisfaction, work effort, and creativity: the role for self-leadership and psychological empowerment, *Journal of Leadership & Organizational Studies*, 22(3), 304-323. Available at: <https://journals.sagepub.com/doi/abs/10.1177/1548051814565819>.
2. Bosak, J., Coetsee, W. J., & Cullinane, S. J. (2013). Safety climate dimensions as predictors for risk behavior. *Accident Analysis & Prevention*, 55, 256-264. Available at: https://www.researchgate.net/publication/236187472_Safety_climate_dimensions_as_predictors_for_risk_behavior.
3. De Koster, R. B., Stam, D., & Balk, B. M. (2011). Accidents happen: The influence of safety-specific transformational leadership, safety consciousness, and hazard reducing systems on warehouse accidents. *Journal of Operations Management*, 29(7/8), 753-765. doi:10.1016/j.jom.2011.06.005.

4. Dodge, B. R. (2012). Patterns of root cause in workplace injury null. *Intl Journal of Workplace Health Mgt*, 5(1), 31-43. <https://doi.org/10.1108/17538351211215375>.
5. Habibi, A., Sarafrazi, A., & Izadyar, S. (2014). Delphi technique theoretical framework in qualitative research. *The International Journal of Engineering and Science*, 3(4), 8-13. Available at: [https://www.researchgate.net/publication/272177606_Delphi_Technique_Theoretical_Framework_in_Qu alitative](https://www.researchgate.net/publication/272177606_Delphi_Technique_Theoretical_Framework_in_Qu_alitative).
6. Heinrich, H.W. (1931). *Industrial accident prevention: A scientific approach*. New York: McGraw-Hill. Available at: https://openlibrary.org/books/OL6754051M/Industrial_accident_prevention.
7. Hofmann, D. A., Burke, M. J., & Zohar, D. (2017). 100 years of occupational safety research: From basic protections and work analysis to a multilevel view of workplace safety and risk. *Journal of Applied Psychology*, 102(3), 375-388. doi:<http://dx.doi.org.contentproxy.phoenix.edu/10.1037/apl0000114>.
8. Idris, M. A., Dollard, M. F., & Tuckey, M. R. (2015). Psychosocial safety climate as a management tool for employee engagement and performance: A multilevel analysis. *International Journal of Stress Management*, 22(2), 183. Available at <http://dx.doi.org/10.1037/a0038986>.
9. Krause, T. R., Groover, D. R., & Martin, D. K. (2010). Preventing incidents & fatalities. *Professional Safety*, 55(6), 46-53. Retrieved from: <https://search-proquest-com.contentproxy.phoenix.edu/docview/734610231?accountid=134061>.
10. Lin, M. (2012). Tales of the unexpected. *The Safety & Health Practitioner*, 30(5), 37-40. Available at: <https://search-proquest-com.contentproxy.phoenix.edu/docview/1019286105?accountid=35812>.
11. McBride, M., & Collinson, G. (2011). Governance of process safety within a global energy company. *Loss Prevention Bulletin*, 217, 15-25. Retrieved from: <http://www.icheme.org/lpb/>.
12. Mullen, J., Kelloway, E. K., & Teed, M. (2017). Employer safety obligations, transformational leadership and their interactive effects on employee safety performance. *Safety Science*, 91, 405–412. <https://doi.org/10.1016/j.ssci.2016.09.007>.
13. Nahrgang, J.D., Morgeson, F.P., & Hofmann, D.A. (2011). Safety at work: a meta analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *Journal of Applied Psychology*, 96(1), 71- 94. DOI: 10.1037/a0021484.
14. Pillay, M. (2015). Accident causation, prevention and safety management: a review of the state-of-the-art. *Procedia manufacturing*, 3, 1838-1845. Available at: <https://www.sciencedirect.com/science/article/pii/S2351978915002255>.
15. Reason, J. (2016). *Managing the risks of organizational accidents*. Available at: <https://www.taylorfrancis.com/books/9781315543543>.
16. Robb, M., & Miller, G. (2012). Human factors engineering in oil and gas - a review of industry guidance. *Work*, 41(Supplement 1), 752-762. doi:10.3233/WOR-2012-0236-752.
17. Rodriguez, M. A., Bell, J., Brown, M., & Carter, D. (2017). Integrating behavioral science with human factors to address process safety. *Journal of Organizational Behavior Management*, 37(3-4), 301-315. Available at: <https://doi.org/10.1080/01608061.2017.1340924>.
18. Sadiq, A. W. (2020). Influence of leadership practices on organizational safety performance (Order No. 27738382). Available from ProQuest Dissertations & Theses Global. (2385667710). Available at: <https://search.proquest.com/docview/2385667710?accountid=45853>.
19. Shamaii, A., Omidvari, M., & Hosseinzadeh Lotfi, F. (2016). Performance assessment of HSE management systems: A fuzzy approach in a Steel Manufacturing Company. *IJOH*, 8(2), 100-109. Available at: <http://ijoh.tums.ac.ir/index.php/ijoh>.
20. Smith, T. A. (1999). What's wrong with behavior-based safety. *Professional Safety*, 44(9), 37-40. Available at: <http://uwualocal304.org/wp-content/uploads/2019/06/whatswrongwithbehaviorbasedsafety.pdf>.
21. Takala, J., Hämäläinen, P., Saarela, K. L., Yun, L. Y., Manickam, K., Jin, T. W., & Lin, G. S. (2014). Global estimates of the burden of injury and illness at work in 2012. *Journal of occupational and environmental hygiene*, 11(5), 326-337. Available at: <https://www.tandfonline.com/doi/pdf/10.1080/15459624.2013.863131>.
22. U.S. Bureau of Labor Statistics. (2019). *Census of Fatal Occupational Injuries Summary, 2017*. Available at: <http://www.bls.gov/news.release/foi.nr0.htm>.
23. U.S. Chemical Safety Board. (2018). *Completed incident investigations and recommendations, 2018*. Available at: <https://www.csb.gov/investigations/completed-investigations/?Type=2>.
24. Wells, John W. Jr. (2015). Building a progressive safety culture: Five crucial tenets. *Professional Safety*, 60(7), 22-23. Available at: <https://search-proquest-com.contentproxy.phoenix.edu/docview/1693348268?accountid=35812>.