DOS AND DON'TS FOR A SAFER WORKPLACE: A STUDY OF PAKISTANI PHARMACEUTICALS

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Abstract: *Purpose of present study was to examine the impact of transformational leadership and safety knowledge on safety climate in pharmaceutical industry of Pakistan. The study also explored the mediating role of safety attitude on these particular relationships. The survey was conducted on employees working in different pharmaceuticals in Rawalpindi. Data was collected from 105 employees using adopted questionnaires consisting of measuring each variable on five point Likert scale. For data analysis statistical tools such as correlation and Regression were tested using SPSS 21.0. Results indicate that transformational leadership is significantly associated with safety climate while employee safety knowledge has no significant impact on safety climate, as safety climate is employees' perception about safety within their organizations so leaders have a major role in making employees' perception regarding safety and social exchange theory supported the whole phenomenon. There is relatively a low understanding of safety knowledge concept in Pakistani organizations and even if this concept is developed in the organizations and is well understood and practiced, the lack of required cultural transformation and support will be a major obstacle to its success in these organizations for years to come. This empirical study identified different factors which directly affect safety climate and proposed a mechanism which will further help different organizations, which are working with more labor, to reduce injury rate and to minimize their expenses caused by workplace accidents as unsafe attitudes along with less safety knowledge lead towards injuries and eventually high organizational costs. It will also help to understand the importance of leadership style in designing employee attitudes and perceptions about the organizations. Results further showed that safety attitude partially mediates the relationship between transformational leadership and safety climate. Results were supported with different reasons and future implications and limitations are also discussed.*

Key words: *Transformational leadership; Safety knowledge; Safety climate; Safety attitude; Social exchange; Social Cognitive theory*

JEL Classification: M50

Introduction

For all organizations employees' health and safety should be of primary concern over operational productivity (Aksorn & Hadicusumu, 2010). According to researchers, sustainability of every type of business is linked with the safety and health of its workers (Nelson, Heiberger & Lee, 2014). International Labor Organization (ILO) stated that every 15 seconds**,** a worker dies from a work-related accident or disease; an estimated 2.3 million people die every year from work-related accidents and diseases. ILO says more than 160 million people suffer from occupational and work-related diseases per year. In developing countries, where the unemployment rate is very high, the situation is more dangerous as workers do not care about their health, they do not report their supervisors about day to day injuries on workplace, and they bear them because they don't want to lose their jobs. Therefore it seems not easy to implement safety standards and procedure

according to the safety regulation in organizations working in developing countries, management concern is required to set organizational safety climate.

Safety climate is particular in nature (Cheyne et al, 1998) as it reflects employees' beliefs and perceptions about safety (Harvey et al, 2002) and involves meaningful working environment interpretations (Mearns et al, 2004). Zohar (1980) introduced safety climate for the very first time (Ford & Tetrick, 2008), which cannot be established without safety knowledge. Safety knowledge refers to exposure of losses, damages, hazards and accidents in terms of health (Kishimoto, 2013) which help to reduce the probability of fatalities (Dzugan, 2010). Employees with safety knowledge and safety compliance help organization to achieve safety related goals. Lewin, Lippitt, and White (1939) studied the impact of mangers on safety climate. According to safety researchers it is strongly argued that large number of occupational injuries is due to poor attitude of management towards safety. Transformational leaders pay special attention to safety through their actions and commitment and motivate their followers to adopt safety procedures to go beyond the individual interests (Ford & Tetrick, 2008) for betterment of the whole organization. Lee (1995) has indicated that safety attitudes are one of the basic components of safety climate (Cheyne et al, 1998). Pidgeon (1991) has identified three major determinants of safety climate: (1) norms and rules for hazards handling; (2) positive safety attitudes; and (3) reflexivity, and arises from a combination of different situational factors (Mearns et al, 1998)

Zohar argued that leadership actions influence employee perception regarding safety and these perceptions then result in safety climate of the organization and social exchange perspective help to understand these safety-related actions (Hofmann & Morgeson, 1999).Pakistan needs safety practices in its industries as in terms of human workforce Pakistan is 10th largest country in the world and because of inadequate safety conditions number of hazardous events happened in Pakistan. International Labor Organization also declared that safety conditions in Pakistani industries are inadequate. The purpose of present study is to direct the attention of authorities towards safety in Pakistan. This study will help to introduce different safety processes in organizations as it examines the impact of transformational leadership and employee safety knowledge on safety climate. This relationship will be more effective if the factor of employee safety attitude positively mediates the relationship between transformational leadership and safety knowledge-safety climate relationship.

Literature Review:

Safety Knowledge and Safety Climate

Safety in organizations can be defined as avoidance from accidental injury and is associated with the safety of employees and organizational stakeholders (Katz, Naven & Stern, 2005). People working in different domains can only protect themselves from different types of damages, accidents and failures if they have knowledge about safety (Klamen, Sanserino & Skolnik, 2013). In order to protect employees from different occupational disasters, management should develop different safety programs (Sivanathan & Barling, 2005) which will give employees knowledge about organizational safety and will help employees to perform in an effective way for betterment of the organization (Klamen et al, 2013). Knowledge (Albrecht, 1995), education, training (Reber and Wallin, 1984) and different organizational policies develop employees' perception and awareness about safety (Han, 2014). Variety of mechanisms is adopted to collect, share and exchange safety knowledge among employees (AL-Husan, AL-Hussan & J.Perkins, 2013). Organizational safety climate is actually a factor which helps to understand employee's awareness about safety (Katz et al, 2005). Literature showed that much work has been

done to reduce environmental pollution (Dietz, Pugh & Wiley, 2004), work related accident (Srivastava, Bartol & Locke, 2006). We are living in much cleaner world than was previously; it is because of awareness and knowledge about safety (Chowdhury & Endres, 2010).
H1: Safety knowledge is significantly associated with safety climate.

Transformational leadership and Safety Climate
The research on leadership in management sciences literature started way back with the seminal work of Galton (1869) who discussed about certain inbuilt characteristics that differentiate leaders from non-leaders and elucidate leader's effectiveness having these characteristics. But in late 1940s researchers began to criticize trait models (Jenkins, 1947). They argued that if trait theories are true, then no other person can become leader if he/she doesn't possess these traits inherently. During 1960s the importance of external/situational factors on effectiveness of leadership was recognized (Fiedler, 1967). In 1980s leadership research witnessed the revival of trait paradigm. Achievement motivation (McClelland, 1967) and charismatic leadership theory (House, 1977) were driving forces behind this revival, soon followed by transformational leadership theory (Burns, 1978) that has gained considerable importance in last two decades.
Transformational leadership boost up the morals and motivation of the followers, inspire them with their charisma, align their objectives with organizational objectives and give them greater ownership for their work (Bass, 1999). This definition of Bass explains the most positive aspects. Whether it is in the form of boosting their morals and motivation through recognizing their work and continuous appreciation or inspiring them to achieve beyond expected levels by setting high standards themselves i.e. inspirational motivation (Hobman, Jackson, Jimmieson & Martin, 2011). The situation of workplace safety in Pakistani organizations is nothing short of horrific and workers are pleading for a safer workplace. So a leadership style specifically targeted at improving safety situation is more than desirable in Pakistani organizations. Social cognitive theory introduced a model for understanding safety climates as the followers of transformational leadership perceive their leaders to be more concerned about the safety at workplace compared to the followers of other leadership (Trop & Grogaard, 2009). Social exchange theory also support this phenomenon, that if employees will feel that management and organization is concerned about their safety and wellbeing then in return they will also try to do good for organization (Kelloway et. al., 2012)and will prefer to follow their leaders' instructions. Transformational leadership intervenes in the safety situation much effectively and has an activist influence on safety climate and safety outcomes (Clarke, 2012). Therefore we postulate that:
H2: Transformational leadership is significantly associated with safety climate.

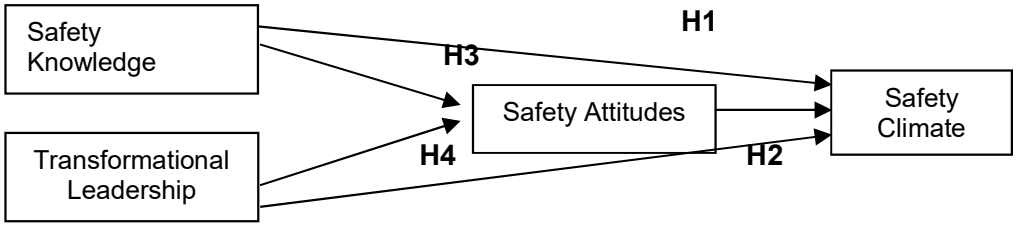
Mediating Role of Safety Attitudes
Attitude is a favorable or unfavorable evaluative reaction toward something or someone, exhibited in ones beliefs, feelings, or intended behavior **(**Cabrera, Fernaud, Sapena, & Casenave, 2010**)**. Safety attitude can be defined as the mental state about safety (Sherehiy & Karwowski, 2006). For people working in different organizations it is not enough having knowledge about safety (Linnehan, Mason & Konrad, 2002) but they should have positive attitudes towards safety (Hardesty & Westerman, 2009). Safety attitudes are basic component of safety climate (Czajka, 1990). Literature shows that there are three distinct components of attitude: cognitive, affective and behavioral. Cognitive related to beliefs, affective related to feelings and behavioral related to act in a certain way about something. So employees' attitude towards safety can be improved through employees' ideas about safety (Dietz, Robinson, Folger, Baron, & Schulz, 2003). Safety knowledge

helps employees to develop positive safety attitudes (Milliman, Czaplewski & Ferguson, 2001). Safety attitudes towards different organizational tasks will lead to safety climate of the organization as employee participation is considered as a key role in organizational outcome (Gandz, & Murray, 1980).The idea of organizational safety climate depends upon how organizational members integrate their perceptions and positive attitudes towards workplace events into perceptions of climate (Lasching, Finegan, Shamian & Wilk, 2002).

H3: Safety attitude significantly mediates the relationship between Safety Knowledge and Safety Climate.

H4: Safety attitude significantly mediates the relationship between Transformational leadership and Safety Climate.

Theoretical Framework:



Methodology:

The purpose of this research is to examine the impact of transformational leadership and safety knowledge on safety climate with mediating role of safety attitude. Data was collected using questionnaires from employees working in pharmaceutical industry in Rawalpindi. 140 questionnaires were distributed and 105 were returned, making the response rate approximately 75%. A 5-point Likert scale was used to assess the outcomes with anchors of 1 = Strongly Disagree, 2=Disagree, 3=neither Agree/nor Disagree, 4=Agree and 5 = Strongly Agree. The collected data was then analysed through SPSS. The exceptions were demographics (age, gender, qualification, income and experience) for which dichotomous and category scales were used.

Instrumentation:

Following instruments were adopted and used in this research:

Transformational leadership:

Transformational leadership was measured using questionnaire developed by Barling et al (2002). The scale consisted of six items. Some of the sample items are, “My leader expresses satisfaction when i perform my job safely”. “My leader suggests new ways of doing job more safely”.

Safety Knowledge:

Employee Performance was measured using a questionnaire developed by Vogus, Sutcliffe, and Weick (2010). Some of the questions were: “I know how to perform my job in a safe manner”. “I know how to use safety equipment and standard work procedures”.

Safety climate:

Safety climate was measured using the scale developed by Neal, Griffin, and Hart (2002). Some of the items are: “Management consider safety to be important. Management is concerned for the safety of the employees”.

Safety attitude:
Safety attitude was measured using questionnaire developed by Sherehiy & Karwowski, (2006). Some of the items are: "Management operates an open door policy on safety issues". "I pay attention to my personal safety on site."

Results:

Correlation analysis:
To examine the connection between independent, dependent and mediating variables the correlation analysis is used.

TABLE 1: Correlation Analysis

Correlation Table						
Predictors	**Mean**	**S.D.**	**1**	**2**	**3**	**4**
1.Transformational Leadership	3.28	0.68	1			
2.Safety Knowledge	3.21	0.54	0.04	1		
3.Safety Climate	3.30	0.63	0.72**	0.34	1	
4.Safety Attitude	3.39	0.80	0.45**	0.03*	0.60**	1

**. Correlation is significant at the 0.01 level (2-tailed). **p
*. Correlation is significant at the 0.05 level (2-tailed). *p
Table 1 indicates correlation between transformational leadership, safety knowledge, safety attitude, and safety climate. The mean for transformational leadership was 3.28 (S.D. = 0.68) and had a significant positive relationship with safety climate (0.72**, $p < 0.01$). Moreover the mean for safety climate was 3.30 (S.D. = 0.63) and for safety knowledge is 3.21. Safety attitude mean was 3.39 (S.D. = 0.80) and it is significantly correlated with transformational leadership (0.45**, $p < 0.01$) whereas there was no significant correlation between safety knowledge and safety climate (0.34, $p > 0.01$).

Regression Analysis:
Two types of regression analysis have been used in this research in order to test the hypotheses as shown in table 2 and 3. Simple regression analysis for outcomes to test the effect of independent variables on dependent variable is shown in table 2. Gender, age, education, marital status and tenure were entered as control variables in the first step and only value of their R square is reported.

TABLE 2: Regression analysis for Outcomes

	Safety Attitude			**Safety Climate**		
Predictors	**Beta**	**R^2**	**$\triangle R^2$**	**Beta**	**R^2**	**$\triangle R^2$**
Step1: Control Variables			0.09			0.34
Step 2:						

Safety Knowledge	.183	.037	.08	.16	.062	.003
Transformational Leadership	.481**	.023	.26*	.67**	.53	.50**
Safety Attitudes				.61**	.024	.068**

N=155, Control variables, Gender, Age, Qualification and Experience
* *P* < .05
** *P* < .01

Regression analysis shows that there is no significant relationship between safety knowledge and safety climate with value of p = 0.12 and t = 1.71 while β = 0.166 i.e. any variance in safety knowledge doesn't cause sufficient variance safety climate. As p should be less than 0.05 and t must be greater than 2 so first hypothesis is rejected that safety knowledge is significantly associated with safety climate.Further analysis shows that there exists significant relationship between transformational leadership and safety climate with p = 0.021* and t = 3.18 while β = 0.673** so second hypothesis is accepted that transformational leadership is significantly associated with safety climate. For third and fourth hypotheses Baron and Kenny (1986) method was used for testing the effect of mediation which requires accomplishment of three conditions for effective mediation. First condition requires significant relation between independent variable and mediator whereas second condition requires significant relation between mediator and dependent variable when independent variable is controlled. I found that no significant relationship exists between safety knowledge and safety attitude with p = 0.22 and t = 1.09 with β = 0.183 whereas the relation between transformational leadership and safety attitude is significant having p = 0.014* and t = 3.96 where β = 0.48**.So third hypothesis is rejected as results violated the first condition of mediation by Baron and Kenny (1986).

Moving onto the next step of mediation for fourth hypothesis I regressed safety climate on safety attitude controlling the effects of transformational leadership. In step 1, I enter the control variables for safety climate. In step 2, I entered transformational leadership and the results explained that there is a positive relationship between safety attitude and safety climate (β = .61**, p = 0.045, t = 2.12) thus completing the first three steps to run mediation. In order to check the third condition I have used mediated regression analysis whose table is given below:

Table 3: Mediated Regression Analysis

Safety Climate			
Predictors	**Beta**	**R^2**	**$\triangle R^2$**
Step1: Control Variables		0.03	
Step 2: Safety Attitudes	0.17**	.024	.068**
Step 3: Transformational Leadership	0.54	.083	.007

Control variables were Gender, Age, Qualification and Experience.
*p<.05
**p<.01

In the last step I tested if safety attitude mediates the relationship between transformational

leadership and safety climate. In step 1 I entered the control variables; the value of R^2 for safety climate was .03. In step 2 I controlled the effect of safety attitude, as shown in table. In step 3 I regress safety climate on transformational leadership and the results showed that although there was a considerable variance in the results but still the path from transformational leadership to safety climate showed significance results ($\beta = .54$, $p < .05$) which means there is only partial mediation and not full mediation according to the explanation of Barron and Kenny (1986).So fourth hypothesis was partially supported and there is partial mediation between transformational leadership and safety climate.

Discussion

The objective of this study was to investigate that whether safety situation in organizations can be improved by using transformational leadership and safety knowledge and whether safety attitude explains the path from transformational leadership and safety knowledge to safety climate. Overall there were mixed results, as one hypothesis was accepted, two were rejected while one was partially supported. First hypothesis proposed that safety knowledge is positively associated with safety climate. This hypothesis was not accepted. There may be many reasons for it. Firstly, in a developing country like Pakistan a significant number of organizations (over 72 percent of the respondents) do not have the required structure for implementing knowledge management initiatives. In the absence of such an enabling environment, organizations have to make greater efforts so that employees can rise above such socio-cultural influences which might impede the sharing and transfer of knowledge and experiences. Secondly, use of information technology infrastructure like decision support tools, enterprise portals, video conferences have a great potential in safety knowledge management but organizations are not yet fully aware of employing these facilitators. Finally, Individuals from high context culture become well informed about the facts associated with a matter before they make a decision. Information is sought and spread usually through discussion with friends, co-workers, relatives and rumors at times. On the contrary, those from low context cultures will prefer consulting a research before making a decision, and will emphasize on the use of reports, databases and other electronic forms of information. Based upon this definition, the Pakistani culture is a high context culture. The Indians, Japanese, and the Chinese also have a high context culture. On the contrary, most of the European and North American regions have a low context culture. Since high context cultures are more relationship oriented and have less explicit communication and formal information and knowledge.

Second hypothesis proposed that transformational leadership is significantly associated with safety climate. The results of regression analysis showed that transformational leadership does have a positive association with safety climate. Similar results have been reported in the literature as well. These results are not surprising as transformational leadership with the followers who are ready to embrace it automatically enhances the perception of employees about the safety climate in the organization. Also the core concept of safety climate is that they are formed on the basis of practical and visible actions taken by organization to improve the safety situation. So a leadership style like transformational leadership is kind of action which can be seen by the workforce which helps to form and improve their perception about the safety climate that is evident in the regression analysis results.

Third hypothesis of present study stated that safety attitude mediates the relationship between safety knowledge and safety climate. Contrary to our expectations safety attitude didn't mediate the relationship between safety knowledge and safety climate. There may be several reasons for this. The main obstacle in developing a safety attitude can be referred to unwillingness of people to develop safety attitude despite of having safety knowledge because more than 90% people are Muslims and they have a strong belief that

no accident can harm them or take their life until its written in their destiny and once something is written in destiny no precautionary measure can postpone it. Although people get training but they don't take it too seriously as in western countries. These factors form the root cause of non-implementation of safety knowledge in developing a safety attitude in Pakistani organizations. Secondly, attitude develops with continuous conscious attention to knowledge but in Pakistan people tend to avoid discussing safety knowledge because there is a culture of fear where employees feel they may no longer be required when they will share everything. In this case, it is important to establish a rewarding culture where trust among teams and business units is the highest. The employees should be rewarded for knowledge sharing, collaborative problem solving, and knowledge development.

Fourth hypothesis was partially accepted that safety attitude mediates relationship between transformational leadership and safety climate. Literature also supports this notion. Moreover, in collectivist societies like Pakistan power distance is very high (Hofstede, 1983) and due to this in Pakistani organizations accept or recognize this high power distance. They are used to not question the leadership style and follow whatever leadership style imposed on them. This hypothesis was not completely accepted, there may be several reasons. Firstly, In Pakistan people are not concerned about developing a safety attitude. There is high level of unemployment, inflation and poverty. People develop such attitude which may help them in doing their existing jobs for longer period of time because cost of switching job is too high for them. They don't consider safety attitude as essential one and prefer other variables over it.

Secondly, Literature suggests that safety attitudes towards different organizational tasks will lead to safety climate of the organization due to high level of employee participation (Gandz, & Murray, 1980) and autonomous work groups (Klein, Molloy & Brinsfield, 2012) but in many Pakistani public and private organizations employees are given structured tasks. Employee participation is not considered essential and people follow whatever guidelines are given to them by their leadership. This results in lack of development of safety attitude among employees.

Implications

Our study has numerous theoretical and practical implications. It adds to the safety literature as well as to the leadership literature. Also the sample was taken from pharmaceutical industry which is an important sector of economy of Pakistan. It adds to safety literature by explaining that in a developing country like Pakistan where the workforce is by and large illiterate so the role of transformational leadership is far more important because the workforce requires more guidance and continuous safety communication to ensure a safe workplace, unlike the workforce of western countries where the observations like near misses or safety events were considered more important.

The practical implications for Pakistani organizations are also of large importance. The fact that transformational leadership does have a great influence on safety outcomes can enable organizations to improve safety situation in their organizations without incurring a mammoth cost. The cost associated with training the leaders to be more safety concerned, is minimal and cost issue has been the most important in Pakistan because the organizations don't want to expand extra money to improve the safety situation. Thus by adopting transformational leadership the organizations in Pakistan can significantly improve the safety environment of organizations. Also the fact that private owners don't want to delegate much of the decision making power to lower level of hierarchy, so these results further strengthens the fact that without giving away much of their governing power they can still implement the transformational leadership and can fetch positive results and can improve the safety situation of organization.

Limitations

Although there have been some very important findings and the results are more generalizable, this study is not without some limitations. Some are as follow:

- Due to time constraints the sample size was not very large and larger sample size would have been more ideal to give more appropriate understanding of causal relationship.
- The cross-sectional nature of study makes it difficult to establish the mediation process, preferably the mediation effects is fully understood in a longitudinal study.
- Transformational leadership is only a part of complete leadership model of Bass (1985). Ideally to completely understand its effectiveness in ensuring safety; the full model of Bass's conceptualization should have been more preferable.
- Due to limited resources and time we could not collect data from other industries i.e. textile, chemical industry and construction industry etc.

Direction for future Research

- First and far most is the use of more comprehensive model of Bass (1985) and specifically the transactional leadership style, which is considered to be the best suited for Pakistan organizations.
- Second, how much these leadership models effect the overall organization climate and culture regarding safety which then in turns improves the safety situation in the organization or can develop a safety culture in the organization.
- Third, the procedural justice and trust in leadership can also be used as mediator in the leadership-safety outcomes relationship but in addition to that we also believe that distributive justice can also be treated as potential mediator in this relationship. As safety incentives which are considered to play an important role in improving safety behaviors, similarly in Pakistan where people always have financial problems because of low level of salaries, distributive justice can help to explain this relationship.
- The last issue which need to be dealt in future is use of culture as moderator because the results of our study has demonstrated some varied results from earlier studies which are conducted in the western countries, so future research must include culture as potential moderator to further clarify these relationships.

References

Aksorn, T. and Hadikusumo, B.H., 2008. Measuring effectiveness of safety programmes in the Thai construction industry. *Construction Management and Economics*, *26*(4), pp.409-421.

Albrecht, J.A., 1995. Food safety knowledge and practices of consumers in the USA. *Journal of Consumer Studies & Home Economics*, *19*(2), pp.119-134.

AL-Husan, F.B., AL-Hussan, F.B. and Perkins, S.J., 2014. Multilevel HRM systems and intermediating variables in MNCs: longitudinal case study research in Middle Eastern settings. *The International Journal of Human Resource Management*, *25*(2), pp.234-251.

Bass, B.M., 1999. Two decades of research and development in transformational leadership. *European journal of work and organizational psychology*, *8*(1), pp.9-32.

Burns, J.M., 1978. Leadership Harper & Row. *New York*.

Cheyne, A., Cox, S., Oliver, A. and Tomás, J.M., 1998. Modelling safety climate in the prediction of levels of safety activity. *Work & Stress*, *12*(3), pp.255-271.

Chowdhury, S.K. and Endres, M.L., 2010. The impact of client variability on nurses'

occupational strain and injury: Cross-level moderation by safety climate. *Academy of Management Journal*, *53*(1), pp.182-198.
Clarke, S. and Ward, K., 2006. The role of leader influence tactics and safety climate in engaging employees' safety participation. *Risk Analysis*,*26*(5), pp.1175-1185.
Czajka, J., 1990, August. THE RELATION OF POSITIVE AND NEGATIVE AFFECTIVITY TO WORKPLACE ATTITUDES. In *Academy of Management Proceedings* (Vol. 1990, No. 1, pp. 201-205). Academy of Management.
Díaz-Cabrera, D., Hernández-Fernaud, E., Ramos-Sapena, Y. and Casenave, S., 2010. Organizational culture and knowledge management systems for promoting organizational health and safety. *Contemporary Occupational Health Psychology: Global Perspectives on Research and Practice, Volume 1*, pp.253-271.
Dietz, J., Pugh, S.D. and Wiley, J.W., 2004. Service climate effects on customer attitudes: An examination of boundary conditions. *Academy of Management Journal*, *47*(1), pp.81-92.
Dietz, J., Robinson, S.L., Folger, R., Baron, R.A. and Schulz, M., 2003. The impact of community violence and an organization's procedural justice climate on workplace aggression. *Academy of Management Journal*, *46*(3), pp.317-326.

Dzugan, J., 2010. The development and efficacy of safety training for commercial fishermen. *Journal of agromedicine*, *15*(4), pp.351-356.

Fiedler, F.E. and Chemers, M.M., 1967. A theory of leadership effectiveness.
Ford, M.T. and Tetrick, L.E., 2008. Safety motivation and human resource management in North America. *The International Journal of Human Resource Management*, *19*(8), pp.1472-1485.
Galton, F., 1869. *Hereditary genius*. Macmillan and Company.
Gandz, J. and Murray, V.V., 1980. The experience of workplace politics.*Academy of Management journal*, *23*(2), pp.237-251.
Han, S., 2014. Note on evaluating safety performance of road infrastructure to motivate safety competition. *International journal of injury control and safety promotion*, pp.1-8.
HARDESTY, A. and WESTERMAN, J.W., 2009, August. RELATING RELIGIOUS BELIEFS TO WORKPLACE VALUES: META-ETHICAL DEVELOPMENT, LOCUS OF CONTROL, AND CONSCIENTIOUSNESS. In*Academy of Management Proceedings* (Vol. 2009, No. 1, pp. 1-6). Academy of Management.
Harvey, J., Erdos, G., Bolam, H., Cox, M.A., Kennedy, J.N. and Gregory, D.T., 2002. An analysis of safety culture attitudes in a highly regulated environment. *Work & Stress*, *16*(1), pp.18-36.
Hobman, E.V., Jackson, C.J., Jimmieson, N.L. and Martin, R., 2011. The effects of transformational leadership behaviours on follower outcomes: An identity-based analysis. *European journal of work and organizational psychology*, *20*(4), pp.553-580.
Hofmann, D.A. and Morgeson, F.P., 1999. Safety-related behavior as a social exchange: The role of perceived organizational support and leader–member exchange. *Journal of applied psychology*, *84*(2), p.286.

Hofstede, G., 1983. The cultural relativity of organizational practices and theories. *Journal of international business studies*, pp.75-89.

House, R.J., 1996. Path-goal theory of leadership: Lessons, legacy, and a reformulated theory. *The Leadership Quarterly*, *7*(3), pp.323-352.

Jenkins, W.O., 1947. A review of leadership studies with particular reference to military problems. *Psychological Bulletin*, *44*(1), p.54.

Katz-Navon, T.A.L., Naveh, E. and Stern, Z., 2005. Safety climate in health care organizations: A multidimensional approach. *Academy of Management Journal*, *48*(6), pp.1075-1089.
Kelloway, E.K., Turner, N., Barling, J. and Loughlin, C., 2012. Transformational leadership and employee psychological well-being: The mediating role of employee trust in leadership. *Work & Stress*, *26*(1), pp.39-55.

Kishimoto, A., 2013. Redefining safety in the era of risk trade-off and sustainability. *Journal of Risk Research*, *16*(3-4), pp.369-377.
Klamen, D.L., Sanserino, K. and Skolnik, P., 2013. Patient safety education: what was, what is, and what will be?. *Teaching and learning in medicine*,*25*(sup1), pp.S44-S49.
LASCHINGER, H.K.S., FINEGAN, J., SHAMIAN, J. and WILK, P., 2002, August. A LONGITUDINAL ANALYSIS OF THE IMPACT OF WORKPLACE EMPOWERMENT ON STAFF NURSES'WORK SATISFACTION. In*Academy of Management Proceedings* (Vol. 2002, No. 1, pp. D1-D6). Academy of Management.
Lewin, K., Lippitt, R. and White, R.K., 1939. Patterns of aggressive behavior in experimentally created "social climates". *The Journal of social psychology*, *10*(2), pp.269-299.
LINNEHAN, F., CHROBOT-MASON, D.O.N.N.A. and KONRAD, A.M., 2002, August. THE IMPORTANCE OF ETHNIC IDENTITY TO ATTITUDES, NORMS, AND BEHAVIORAL INTENTIONS TOWARD DIVERSITY. In*Academy of Management Proceedings* (Vol. 2002, No. 1, pp. D1-D6). Academy of Management.
McClelland, D.C., 1967. *Achieving society*. Simon and Schuster.
Mearns, K., Flin, R., Gordon, R. and Fleming, M., 1998. Measuring safety climate on offshore installations. *Work & Stress*, *12*(3), pp.238-254.

Mearns, K., Rundmo, T., Flin, R., Gordon, R. and Fleming, M., 2004. Evaluation of psychosocial and organizational factors in offshore safety: a comparative study. *Journal of Risk Research*, *7*(5), pp.545-561.
Milliman, J.F., Czaplewski, A.J. and Ferguson, J.M., 2001, August. AN EXPLORATORY EMPIRICAL ASSESSMENT OF THE RELATIONSHIP BETWEEN SPIRITUALITY AND EMPLOYEE WORK ATTITUDES. In*Academy of Management proceedings* (Vol. 2001, No. 1, pp. B1-B6). Academy of Management.
Nelson, W.J., Heiberger, S. and Lee, B.C., 2014. Raising the Profile of Worker Safety: Highlights of the 2013 North American Agricultural Safety Summit. *Journal of agromedicine*, *19*(2), pp.69-73.
Reber, R.A. and Wallin, J.A., 1984. The effects of training, goal setting, and knowledge of results on safe behavior: A component analysis. *Academy of Management Journal*, *27*(3), pp.544-560.
Sherehiy, B. and Karwowski, W., 2006. Knowledge management for occupational safety, health, and ergonomics. *Human Factors and Ergonomics in Manufacturing & Service Industries*, *16*(3), pp.309-319.
Sivanathan, N., Turner, N. and Barling, J., 2005, August. EFFECTS OF TRANSFORMATIONAL LEADERSHIP TRAINING ON EMPLOYEE SAFETY PERFORMANCE: A QUASI-EXPERIMENT STUDY. In *Academy of Management Proceedings* (Vol. 2005, No. 1, pp. N1-N6). Academy of Management.
Srivastava, A., Bartol, K.M. and Locke, E.A., 2006. Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance. *Academy of management journal*, *49*(6), pp.1239-1251.

Torp, S. and Grøgaard, J.B., 2009. The influence of individual and contextual work factors

on workers' compliance with health and safety routines. *Applied ergonomics*, *40*(2), pp.185-193.
Zohar, D., 2002. The effects of leadership dimensions, safety climate, and assigned priorities on minor injuries in work groups. *Journal of Organizational Behavior*, *23*(1), pp.75-92.