

Impact of Psychological and Management Factors on Reduction of Safety Risks: A Study of Chemical Companies of Pakistan

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ABSTRACT

With limited resources to help decrease occupational accidents, companies struggle to spend those resources in reducing these injury risks with optimal costs. Companies are now aware about occupational health and safety risks; but, there is need to make better workplace conditions in Pakistan to reduce the injury risks. The study aimed to examine the effect of human resource management factors on the injury risks occurred in chemical companies of Pakistan. The study is quantitative in nature used deductive approach of research. Stratified random sampling technique and questionnaires based on 5-point likert scale was used to collect data from employees (N=180) of four chemical companies. Findings indicate that human resource management factors (management commitment, communication & feedback, and psychological stress) have greater impacts on the injury risks among employees of these companies. The findings of study offer with deep insight into resolving the occupational risk factors of companies' employees. The future research recommendations and practical implications for management have also been discussed.

KEY WORDS: occupational, safety, human resource, stress, health, injury, risk.

1. INTRODUCTION

The concept of an occupational health and safety management system (OHSMS) has become evident over the previous twenty years. The issue of occupational safety and health is gaining recognition from researchers in Pakistan and around the globe due to its critical importance. In past, the technological reasons are found to be the causes of injury and accidents at workplace and therefore, gained importance. Conversely, comparatively little proportion of injuries and accidents has been proved due to unsafe physical and mechanical conditions. On-the-job accidents and injuries appear to be the result of employees' unsafe acts at the site. The accidents and injuries are the end results caused from the organizational factors and practices on operational and manufacturing levels (Wilpert, 1994). The technology is not only responsible for accidents and injuries. Employees, companies, organizational and employees' culture and groups' together design, operate, construct and control the machinery and cause the occupational accidents. Recent literature deeply discussed the human error factor causing injuries. The OHS conscious companies focus on hiring educated employees because they expect and demand for safer work environment.

Studies have found that safety behavior of organizations and safety beliefs have a leading effect on organizational safety performance (Ostrom et al., 1993). Safety culture is defined as "organization's norms, beliefs, attitudes, roles and practices concerned with minimizing exposure of employees to workplace hazards" (Turner, 1991). The safety culture purposes that the workers must be aware of safety issues at workplace and a continuous observation should be there to remove the hazards occurred during manufacturing operations (Ostrom et al., 1993). A good safety culture develops safe behaviors among employees. Studies have originated a relationship between organizational safety culture and organizational safety performance. Researchers explained some prevailing factors of safety culture which have effect on injury risks (Turner, 1991; Pidgeon, 1991).

The purpose of this study is to investigate the effect of management commitment, safety training, hiring practices and occupational stress on employee perception of occupational risk. The chemical companies of Punjab, Pakistan are the context of this research. No study has been found by researcher on impact of these human resource factors in chemical sector of Pakistan which provides motivation to conduct research.

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2. Objectives of Study

- To investigate the effect of these human resource management factors in resolving the injury risks in chemical companies of Pakistan.
- To establish a universal human resource management theory for safety issues in chemical sector of Pakistan.
- To provide recommendations to management of these companies to establish some effective measures in reducing the occupational health and safety risks.

3. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

3.1 Top Management Commitment

The top management commitment towards safety adds value towards implementation and success of organizational safety programs (Zohar, 1980). This commitment is apparent from participation in safety commissions and committees, and devises the safety policy in designing a job. The commitment of a manager at workplace matters a lot. Hofmann and Stetzer (1996) explained that workers working under a plant manager, who has no concern with safety issues and does not explain the safety problems to employees, he has less control over employees. Consequently, employees identify the safety as an unimportant factor at workplace and thus it will cause injuries. There are two factors behind the motivation to perform a safer job i.e. individual employee concern with safety and manager's communicated concern for safety. Cohen and Cleveland (1983) argued that the direct contact of plant safety director with plant manager reduces the probability of injury occurrence. Management must implement the good safety programs and outcomes can be observed through behaviors and attitudes of top management (Hofmann *et al.*, 1995). The management commitment has an influential impact in determining the injury risks; which is the initiative of a Medical Director at US hospital. It has been described that the dedicated support from top management of organizations would definitely achieve the safety program objectives (Garrett and Perry, 1996). It was concluded that management commitment was the important factor in developing perceptions about the safety climate of organizations (O'Toole *et al.*, 2002).

H1. The top management commitment of chemical companies of Pakistan has a negative relationship with injury risks at workplace.

3.2 Communication and Feedback

Feedback given to lower workers has a significant relationship with employee performance at job, and hence reduces industrial accidents. The feedback on employee performance is communicated to employees through evaluation of employees' behavioral data in safety meetings and workshops (Roughton, 1993). The employees must be encouraged to report to top management about the hazards they faced during manufacturing operations. The employees must not be blamed or held convicted in case of accidents or injuries occurrences to encourage healthy communication in organizational settings. The communication is an important element of any prestigious organization which leads to trust and enhances the strength of organization. To implement safety practices, capable employees must be provided with feedback. Employees don't work in a safe manner unless they have enough authority to amend their own actions. Workers should have powers to avoid hazards (Turner, 1991).

H2. The higher the communication and feedback given to workers by top management, the lower the occurrence of injury rates in chemical sector of Pakistan.

3.3 Psychological Stress

Workplace stress negatively influences the satisfaction of employees which therefore become the cause of high occupational accidents (Tabatabaei *et al.*, 2011). Kotze and Steyn (2013) conducted a study using ANOVA test in electricity Supply Company among 279 employees and results indicate that workplace stress has a critical impact on safe environment of organization. Similarly, Shain (2012) elaborated the significance of workers' mental health and its prolonged effects on good safety culture. Storey and Billingham (2010) expressed that occupational stress exhibits strong positive link with performance of workers at workplace and thus distracts their attention from the routine job. Saksvik (2002) explored that the implementation of safety processes is restricted by the stress raised during duties and work.

H3. The higher the workers' psychological stress at workplace, the higher the injury risks in chemical sector of Pakistan.

4. RESEARCH METHODOLOGY

The environment of chemical companies was selected for research purpose and it would be used as predictor to measure the impact of management factors to decrease injury rates. The level of analysis was specified as organizational level. Four companies namely Ittehad Chemicals, Sitara Chemicals, Masood Textile Mills and Ibrahim Fibres were targeted. The stratified random sampling was used which was based on organizational departments. The respondents were the employees of these companies working directly at danger places where chances of injuries are greater. Participation was voluntary in data collection. A pre-tested questionnaire based on 5-point likert (Greater extent=5, No extent=1) scale was implied as data collection instrument to gather data (Vredenburg, 2002). Three items were used to analyze each of these management constructs. Equal proportion of questionnaires was distributed in all four companies. Questionnaires were mailed to companies' address and considerable response rate was observed. Out of 300 mailed questionnaires, 180 (60%) were returned completed. Multiple regression analysis, reliability analysis, t-statistics, confirmatory factor analysis and descriptive statistics were conducted to analyze the collected data.

5. Findings of Study

5.1 Confirmatory Factor Analysis and Reliability Statistics

The variables used in the study were adopted from numerous previous tested studies. The confirmatory factor analysis (CFA) results revealed that factors loadings of all constructs were above the minimum criteria of 0.5 which can be acceptable. The values of variance extracted (VE) are also above the standard value (0.5). The internal consistency of instrumental data is measured through Chronbach's alpha (α) measure. Top management commitment, communication and feedback, psychological stress has cronbach's alpha values of 0.823, 0.775 and 0.798 respectively.

Table 1. Reliability Statistics

Proposed Constructs	Original Cronbach's α (previous literature)	Cronbach's α coefficient
Top Management Commitment	0.91	0.823
Communication & Feedback	0.932	0.775
Psychological Stress	0.890	0.798

5.2 Regression Results and Model Fitness

Findings indicate that all the constructs have significant effects and determine the injury risks at workplace. The results of ANOVA model statistics authenticate the model fitness. The results of chemical companies (Adjusted $R^2=0.586$, $F=85.456$, Durbin-Watson=1.974, $p=0.000$) illustrate that top management commitment, communication & feedback and psychological stress significantly determined the injury risk. The results of correlation coefficient of top management commitment show that ($\beta=-0.408$, $t=5.37$, $p<0.05$) the variables are significantly related to each other. These results endow with justification to accept H1. The results regarding communication and feedback ($\beta=-0.553$, $t=6.45$, $p<0.05$) designate H2 acceptance. The psychological stress is also positively associated with injury risks ($\beta=0.535$, $t=4.97$, $p<0.05$). Thus, the study accepts H3.

Table 3. Summary of Study Hypotheses

Attributes	Estimates (β)	p-value	Status
Top Management Commitment	(-0.408)	0.012	Accepted
Communication & Feedback	(-0.553)	0.030	Accepted
Occupational Stress	(-0.535)	0.000	Accepted

6. DISCUSSION AND RECOMMENDATIONS

It has been concluded that companies' management must initiate proactive techniques to protect workers. This study methodically examines the fundamentals of human resource management which determine the injury risk. The findings may help in constituting occupational health and safety laws and valid occupational requirement in industry. Moreover, safety performance of companies definitely adds up to the output and productivity of companies. It is clear from results that construct of top management commitment is very important because it has a

direct link with likelihood of injury risks. Companies should arranged seminars and safety trainings to employees. Companies should have a position of risk manager and it must fall in top level. It must make sure that safe practices are implementing at workplace. Companies must execute reactive approaches for accidents prevention. A good rewards system in companies acts as a measure to avoid from the injuries issue. However, psychological stress plays a major role in producing distraction from work activities among companies' employees. However, social and environmental conditions of Pakistani society became the causes of such problems. Lack of perfect communication between top management and employees inhibits the reasons for such problems. The efficiently established safety programs and avoiding measures should be extended among employees of companies.

7. Limitations

Since this study is of a first kind of its nature related to occupational safety and health of chemical companies employees; so, the replication of previous studies is recommended. The environment of chemical companies in Pakistan is the challenging place to execute research. The smaller number of companies and respondents impede limitations on generalizability of findings. The study was limited to quantitative approach because of cost and time constraints.

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