

Risk Management of Hazardous Chemical and its Impact on Occupational Stress and Performance in Chemical Companies of Tuticorin District of Tamil Nadu

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Abstract: Work stress has become a common problem being faced by employees in many organizations regardless of any industry that they work today particularly workload, role conflict, resource management, maintenance problem, health problem due to working environment and inadequate monetary rewards are the prime reasons of causing stress in employees that leads to reduced employee efficiency. Different aspects of employee job performance that are likely to be affected by stress include Productivity, Job Satisfaction / Morale, Absenteeism, Decision Making Abilities, Accuracy, Creativity, Attention to Personal Appearance, Organizational Skills, Courtesy Cooperation, Initiative, Reliability, Alertness, Perseverance and Tardiness.

Key Words: *Risk Management, Occupational Stress and Performance*

1. Introduction

The study can be significant particularly for employers who after knowing the occupational stress inducers (OSI), can adopt appropriate strategies to reduce the occupational stress thereby enhancing the employees' job performance; and the employees, who after being aware can take appropriate steps to reduce their own stress, saving themselves from variety of health issues and also help management to implement the stress management strategies. Workers who are stressed are also more likely to be unhealthy, poorly motivated, less productive and less safe at work. Their organizations are less likely to be successful in a competitive market. Stress can be brought about by pressures at home and at work. Employers can protect employees from stress that arises through work. Stress at work can be a real problem to the organization as well as for its workers. Good management and good work organization are the best forms of stress prevention and managing health problems by managing issues in chemical hazards. This study is helpful in assessing the extent of stress and health issues experienced by the employees. So this study helps the organization to take necessary steps by the employer to protect employees against any risk from exposure, Precautions to be taken by an employee to protect himself against the health risks associated exposure, Correct use, maintenance of safety equipment, facilities and engineering controls, Importance of good housekeeping at the workplace and personal hygiene, Safe working procedures. Correct stress management should start from improved health and good intrapersonal relationships. The prevention and management of workplace stress requires organizational level interventions and healthy management of occupational chemical hazard, because it is the organization that creates the stress. Success in managing and preventing stress will depend on the culture in the organization. A culture of openness and understanding, rather than of criticism, is essential.

To conceptualize and operationalize employees work performance, we should explicate the construct domain of workers productivity and identify its dimensional factors. Whereas the dimensions may generalize across duties, the exact indicators can differ between roles. In the field of psychology, the conceptualization of work performance has much attention. A widely endorsed definition of work performance is that of Campbell: “behaviors or actions that are relevant to the objectives of the organization. Three notions accompany this definition: (1) work performance should be defined in terms of attitude rather than results, (2) workers productivity includes only those behaviors that are relevant to the organization’s goals, and (3) work performance is multidimensional factor. Work performance should be distinguished from workers performance, Work productivity is meant as input divided by output. Thus, work output is a narrower concept than work performance. It is also important to distinguish between casual variables and indicators of work output. Causal variables determine or predict one’s level of work output, whereas indicators are reflections of work productivity. For example, job satisfaction is considered a factor of work performance, whereas work quality is an indicator of work productivity.

2. Purpose and Objectives

To analyze the risks of hazardous chemicals and the effect of occupational stress on workforce performance: an Empirical study on selected chemical companies in Tuticorin. To find out the occupational hazards in selected chemical companies of Tuticorin. To study the impact of workplace practices for Managing risks of hazardous chemical. To find out the occupational stress experienced by workers in companies under study. To examine the relationship between Managing risks of hazardous chemical and workforce stress in Chemical Companies of Tuticorin. To analyze the relationship between chemical induced occupational stress and occupational performance. To offer suggestion to overcome occupational induced stress and to improve work performance. Sampling design is to clearly define set of objects, technically called the universe and the sampling design used in the study is probability sampling. The sampling technique is “Simple random sampling” of probability sampling method. All data were analysed using the Statistical Package for the Social Sciences (SPSS 11). In order to normalize the Likert scale on 1-5 scales for each domain of risk of chemical hazard induced to occupational stress and its impact on work performance questionnaire, the sum of raw scores of items in each domain was divided by the numbers of items in each domain (4) and for overall, sum of raw scores of items were divided by 36 respectively. The possible justified scores were varied between 1 and 5.

3. Scope of the Study

This study is helpful in assessing the extent of stress and health issues experienced by the workers. So this study helps the industry to take necessary steps by the manufacturer to protect workers against any risk from exposure, Precautions to be taken by an worker to protect himself against the health risks associated exposure, Correct use, maintenance of safety equipment, facilities and engineering controls, Importance of good housekeeping at the working environment and personal hygiene, Safe working procedures.

4. Analysis and Interpretation

The researcher proceeded to the data processing and data analysis stage after the data collection. Data processing may consist of activities and technologies which prepare the collected data for analysis data checking, entry, coding, and editing (Gromme, 1998). Data analysis comes after the data have been collected to make sense of the study and reach certain findings (Yaghi, 2010). Data analysis concerns activities and technologies which provide statistical insight in the collected data weighting, tabulations, and response analysis (Gromme, 1998). Data were analyzed in order to draw the conclusion from the collected data.

Table 1.1 Mean and Standard Deviation

	Measuring Variable	Mean	Sd
Risks Management	Safety of Workers	2.82	1.233
	Safety Use of Chemicals at Work	2.93	1.192
	Mean Score	2.93	1.191
Work Place Stress	Safety Measures	2.74	1.27
	Work Stress	2.65	1.33
	Mean Score	2.71	.882
Job Performance	Organisational Support	2.63	1.114
	Self Support	2.48	1.258
	Mean Score	2.62	1.052

From the table it's much clear that the Respondents are having a moderate feel towards the Variable "Safety Use of Chemicals at Work" with a mean value of 2.93 and a standard deviation of 1.192. Similarly Respondents are having a moderate feel towards the Variable "Safety of Workers" with a mean value of 2.82 and a standard deviation of 1.233. The Respondents are having a moderate feel towards the Variable "Safety Measures" with a mean value of 2.74 and a standard deviation of 1.27. Similarly Respondents are having a moderate feel towards the Variable "Work Stress" with a mean value of 2.65 and a standard deviation of 1.33. The Respondents are having a moderate feel Owards the Variable "Organisational Support" with a mean value of 2.63 and a standard deviation of 1.114. Similarly Respondents are having a moderate feel towards the Variable "Self Support" with a mean value of 2.48 and a standard deviation of 1.258.

4.2 Structural Equation Model

The impact of the independent variable over the dependent variable is measured using the path analysis. The influence is found out using Regression Weights and the degree of change in the independent variables is found out using squared multiple correlation. The model is segmented into five sub parts like;

Table 1.2 Model Fit - Impact of Work Place Practices on Risks Management of Hazardous Chemical, Work Place Stress, Occupational Induced Stress and Job Performance

Test for model fit	Values
GFI (Goodness of Fit)	0.921
AGFI(Adjusted Goodness of Fit)	0.938

The **GFI (Goodness of Fit)** and **AGFI (Adjusted Goodness of Fit Index)** should be nearing to one or one indicates that the model is a good fit. In this model it's nearing one so it indicates that the model is a good fit. In this model the GFI value is 0.921 and AGFI value is 0.938. This clearly implies that the model is a good fit.

Figure. 4.1. Impact of Work Place Practices on Risks Management of Hazardous Chemical, Work Place Stress, Occupational Induced Stress and Job Performance

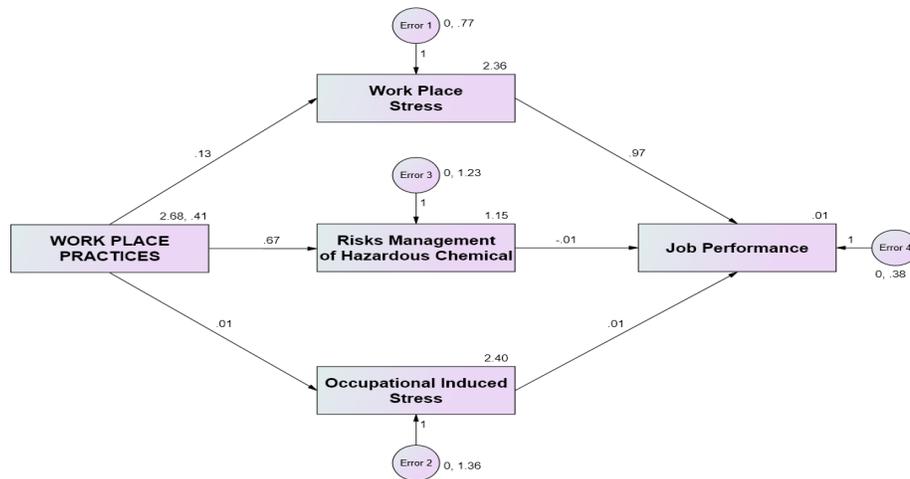


Table 1.3 Regression Weight – Impact of Work Place Practices on Risks Management of Hazardous Chemical, Work Place Stress, Occupational Induced Stress and Job Performance

Variable	Inf.	Variable	E	SE	E.	R.	P
Work Place Stress	←	Work Place Practices	0.131	0.095	0.051	2.564	0.01**
Occupational Induced Stress	←	Work Place Practices	0.012	0.007	0.068	0.176	0.86
Risks Management of Hazardous Chemical	←	Work Place Practices	0.665	0.358	0.065	10.269	***
Job Performance	←	Risks Management of Hazardous Chemical	-0.014	-0.016	0.019	-0.728	0.467
Job Performance	←	Work Place Stress	0.97	0.812	0.026	37.125	***
Job Performance	←	Occupational Induced Stress	0.007	0.007	0.02	0.334	0.738
Work Place Stress	←	Work Place Practices	0.131	0.095	0.051	2.564	0.01**
Occupational Induced Stress	←	Work Place Practices	0.012	0.007	0.068	0.176	0.86
Risks Management of Hazardous Chemical	←	Work Place Practices	0.665	0.358	0.065	10.269	***
Job Performance	←	Risks Management of Hazardous Chemical	-0.014	-0.016	0.019	-0.728	0.467
Job Performance	←	Work Place Stress	0.97	0.812	0.026	37.125	***
*** Significant at 0.001percentage Level			S.E – Standard Error				
** Significant at 0.05percentage Level			C.R – Critical Ration				
UE – Unstandardised Estimate			P – Probability Value				
SE – Standardised Estimate			Inf. - Influence				

Positive Influence - If work place practices rise to one degree up in the positive direction, then it can be seen 0.131 increases in the work place stress.

No Influence - The independent variable work place practices do not influence the dependent variable occupational induced stress.

Table 1.4 Squared Multiple Correlations - Impact of Work Place Practices on Risks Management of Hazardous Chemical, Work Place Stress, Occupational Induced Stress and Job Performance

Variable	Estimate
Risks Management of Hazardous Chemical	0.128
Occupational Induced Stress	0.000
Work Place Stress	0.009
Job Performance	0.658

- The dependent variable risks management of hazardous chemical shows 12.8 percentage of its variance in when influence by the independent variable work place practices.
- The dependent variables occupational induced stress shows zero percentage of its variance in when influence by the independent variable work place practices.
- The dependent variable work place stress shows 0.9 percentage of its variance in when influence by the independent variable work place practices.
- The dependent variable Job Performance shows 65.8 percentage of its variance in when influence by the independent variable risks management of hazardous chemical, occupational induced stress and work place stress.

5. Findings

The respondents are having a moderate feel towards the variable “Risks Management of Hazardous Chemical” with a mean value of 2.93 and a standard deviation of 1.191. The respondents are having a moderate feel towards the variable “Overall Work Place Stress” with a mean value of 2.71 and a standard deviation of .882. The respondents are having a moderate feel towards the variable “Overall Job Performance” with a mean value of 2.62 and a standard deviation of 1.052.

6. Conclusion

Workers should not be exposed to chemicals hazardous to health, in particular to an extent which exceeds exposure limits or other exposure criteria for the evaluation and control of the working environment established by the competent authority, or by a body approved or recognised by the competent authority in accordance with national or international standards. The adequacy of the means of escape, fire-fighting arrangements, the fire alarm system and provisions for the evacuation of the premises should be considered, following the assessment of chemicals that may be flammable, unstable or explosive. Hazardous chemicals should be stored under conditions specific to their inherent properties and characteristics to ensure safety and in accordance with established criteria.

Chemicals with typical properties and characteristics that are relevant include: flammable liquids; flammable gases; toxic chemicals; corrosive chemicals; chemicals that emit highly toxic fumes in the event of a fire; chemicals which, in contact with water, give off flammable gas; oxidising chemicals; explosives; unstable chemicals; flammable solids; compressed gases. Safe siting of storage areas. In order to minimise the effects of an incident, storage areas for chemicals should be kept separate from process areas, occupied buildings and other storage areas, as well as from boundaries and off-site premises over which the employer has no control, and fixed sources of ignition, except for a small quantity of a hazardous chemical stored in a workplace in a safe manner safe loading and unloading of storage

To prevent the spread of a hazardous chemical in the event of its release, a secondary means of containment should be provided in accordance with established criteria, such as bund walls for hazardous liquids, diversion walls and evaporation areas for heavier-than-air flammable gases at or near their boiling points at ambient temperature (e.g. butane), and containment areas for the evaporation of cryogenic liquids. A “bund wall” is a properly designed and constructed containment wall to contain the contents of a storage vessel enclosed by the wall. A “diversion wall” is a low wall adjacent to a storage vessel used to divert released flammable gas and liquid away from danger areas and to an area for safe evaporation. written work procedures should be devised and followed where good work procedures and practices are of primary importance, e.g. during routine maintenance, the testing, examination and repair of plant and equipment, the transfer of chemicals (including loading and unloading) and identification of the content of containers, including the potential hazards and corresponding precautions. The results of medical records should be made available to prepare appropriate health statistics and epidemiological studies, provided anonymity is maintained, where this may aid in the recognition and control of occupational diseases.

7. References

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