

## A STUDY ON HAZARDOUS CHEMICAL AND ITS IMPACT ON OCCUPATIONAL STRESS AND PERFORMANCE IN CHEMICAL COMPANIES OF TUTICORIN

J. Nithya<sup>1</sup>

### 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.*

### 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

---

<sup>1</sup> . Assistant Professor, Department of Management Studies, Dr. Sivanthi Aditanar College of Engineering, Tiruchendur, Tamilnadu.

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.

### **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.

### **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.

### **Controlling Exposures and Finding Alternatives**

Based on the available information regarding the toxicity of substances used in the chemical industry and our knowledge of workers' exposures, it is clear that more effective measures must be put in chemical interviews and review of government inspections reveal, women working in the chemical industry experienced serious symptoms and illnesses

#### **Mean and Standard Deviation of Overall Work Place Practices**

<b>Measuring Variables</b>	<b>Mean</b>	<b>Sd</b>
Organizational Support	2.67	1.432
Co-Workers Support	1.75	.996
Motivation Support	1.62	1.022
Self Development Support	1.79	.803

Work Demand Support	2.18	1.037
Monetary Support	2.66	1.614
Career Support	3.59	1.195
Work Environment Support	3.89	1.368
Morale Support	3.44	.871
<b>Mean Score</b>	<b>2.68</b>	<b>.641</b>

From the table it's much clear that the respondents agree towards the Work Environment Support with a mean value of 3.89 and a standard deviation of 1.368. Similarly Respondents agree towards the Career Support with a mean value of 3.59 and a standard deviation of 1.195. Similarly respondents agree towards the Monetary Support with a mean value of 3.44 and a standard deviation of 0.871.

Whereas respondents are having a moderate feel towards the statement Organizational Support with a mean value of 2.67 and a standard deviation of 1.432. . Similarly respondents are having a moderate feel towards the Monetary Support with a mean value of 2.66 and a standard deviation of 1.614.

Whereas respondents disagree towards the Variable Self Development Support with a mean value of 1.79 and a standard deviation of .803. Similarly respondents disagree towards the Variable Co-Workers Support with a mean value of 1.75 and a standard deviation of .996 and finally respondents disagree towards the Motivation Support with a mean value of 1.62 and a standard deviation of 1.022.

Thus its much clear that the response are having a moderate feel with the overall "workplace practices variable" with a mean value of 2.68 and a standard deviation of 0.641.

#### **Mean and Standard Deviation of Overall Occupational Induced Stress**

<b>Measuring Variable</b>	<b>Mean</b>	<b>Sd</b>
Work Pressure	2.73	1.633
Mental Pressure	2.18	1.468
<b>Mean Score</b>	<b>2.44</b>	<b>1.165</b>

From the table it's much clear that the response are having a moderate feel towards the Variable "Work Pressure" with a mean value of 2.73 and a standard deviation of 1.633. Similarly respondents are having a moderate feel towards the Variable "Mental Pressure" with a mean value of 2.18 and a standard deviation of 1.1468.

Thus it's much clear that the respondents are having a moderate feel with the variable "Overall Occupational Induced Stress" with a mean value of 2.44 and a standard deviation of 1.165.

#### **Mean and Standard Deviation of Overall Job Performance**

<b>Measuring Variable</b>	<b>Mean</b>	<b>Sd</b>
Organizational Support	2.63	1.114
Self Support	2.48	1.258
<b>Mean Score</b>	<b>2.62</b>	<b>1.052</b>

From the table it's much clear that the Respondents are having a moderate feel towards the Variable "Organizational 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.

Thus it's much clear that 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.

### Model Summary - Influence of Variables of Work Place Practices on Overall Work Place Practices

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.891	.795	.792	.292
<i>Dependent Variable: overall work place practices</i>				
<i>Independent Variable: organizational support, co-workers support, motivation support, self development support, work demand support, monetary support, career support, work environment support and morale support</i>				

The model summary table shows R-Square for this model is 0.795. This means that 79.5 percent of the variation in work place practices (dependent variable) can be explained by the nine independent variables like organizational support, co-workers support, motivation support, self development support, work demand support, monetary support, career support, work environment support and morale support.

### Model Summary - Influence of Variables of Risks Management of Hazardous Chemical on Overall Risks Management of Hazardous Chemical

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999	.998	.998	.053
<i>Dependent Variable: overall risks management of hazardous chemical</i>				
<i>Independent Variable: safety of workers and safety use of chemicals at work</i>				

The model summary table shows R-Square for this model is 0.998. This means that 99.8 percent of the variation in work place practices (dependent variable) can be explained by the nine independent variables like safety of workers and safety use of chemicals at work.

### Model Summary - Influence of Variables of Work Place Stress on Overall Work Place Stress

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.167	.028	.025	1.151
<i>Dependent Variable: overall work place stress</i>				
<i>Independent Variable: safety measures and work stress</i>				

The model summary table shows R-Square for this model is 0.028. This means that 2.8 percent of the variation in work place practices (dependent variable) can be explained by the nine independent variables like safety measures and work stress.

### Model Summary - Influence of Variables of Job Performance on Overall Job Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.949	.900	.900	.333
<i>Dependent Variable: overall job performance</i>				
<i>Independent Variable: organisational support and self support</i>				

The model summary table shows R-Square for this model is 0.900. This means that 90 percent of the variation in work place practices (dependent variable) can be explained by the nine independent variables like safety of workers and safety use of chemicals at work.

## 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 recognized 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; oxidizing chemicals; explosives; unstable chemicals; flammable solids; compressed gases. safe sitting of storage areas. In order to minimize 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 containers. Criteria relating to suitable equipment and safe systems of work, including training To reduce leaks, where particularly hazardous chemicals are used, enclosed plant and equipment should be fitted with extraction systems, which should be designed to ensure a slight negative pressure within the plant and equipment, where the process allows. Extraction systems should vent to a safe place, or contaminated air should be filtered or treated to ensure that exposure limits or other established criteria for the control of the working environment are not exceeded.

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.

**Reference**

1. **Kashif Ali (2013)** “Occupational Stress effects and Job Performance in the Teachers of Schools of Punjab” International Journal of Academic Research in Business and Social Sciences November 2013, Vol. 3, No. 11 ISSN: 2222-6990 Pp 665-680.
2. **Warraich Usman Ali1, Ahmed Rizwan Raheem1, Ahmad Nawaz1 and Khoso Imamuddin2 (2014)** “Impact of Stress on Job Performance: An Empirical study of the Employees of Private Sector Universities of Karachi”, Pakistan Research Journal of Management Sciences ISSN 2319–1171 Vol. 3(7),pp 14-17.
3. **Ejaz Ahmed Khan, Muhammad Aqeel, and Muhammad Akram Riaz (2014)** “Impact of Job Stress on Job Attitudes and Life Satisfaction in College Lecturers”, International Journal of Information and Education Technology, Vol. 4, No. 3, June 2014 Pp 270-273.
4. **Ibtisam Mbarak Awadh , Lucy Gichinga and Dr. Anwar Hood Ahmed (2015)** Effects of Workplace Stress on Employee Performance with occupational hazard in the County Governments in Kenya: A Case Study of Kilifi County Government International Journal of Scientific and Research Publications, Volume 5, Issue 10, October 2015 1 ISSN 2250-3153, Pp 1-8
5. **Oyungerel Altangerel, Wang Ruimei, Ehsan Elahi, Bayandalai Dash (2015)**, “Investigating The Effect Of Job Stress On Health and Safety issues”, international journal of scientific & technology research volume 4, issue 02, ISSN 2277-8616 pp 276-280.  
*iences, 2(2), 61-67.*