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# Analysis of Factors Responsible For of Work Stress In Chemical Industries In Kerala, India

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**Abstract** - This study examines the influence of factors responsible for work stress among the employees in the chemical industries in Kerala, India. The sample size of the subjects selected for the study consists of 75 Engineers, 110 Supervisors and 675 Workers in the selected chemical industries in Kerala, India. Seven factors were identified with the existing literatures, and in consultation with safety experts for the evaluation of work stress. The instrument developed by using these factors had validity, unidimensionality and reliability. The response rate was 81.3%. It is observed that existence the factors responsible for work stress among all the categories of employees in these industries.

**Keywords:** *Work stress, validity, unidimensionality, reliability, chemical industries.*

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## I. INTRODUCTION

Occupational stress is becoming a major problem in both corporate and social sectors. In industrialized countries, there have been quite dramatic changes in the conditions of work, during the last decade due to the economic, social and technical development. As a consequence the people today at work are exposed to high quantitative and qualitative demands at the work place. In multinational companies, lean production, and down sizing has raised stress level of employees [1]. The national institute of occupational safety and health (NIOSH-USA) defines stress as “the harmful physical and emotional responses that occur when the requirements of the job does not match with the capabilities, resources of the workers.”

The cost associated with work place stress indicate an international trend among industrialized countries. A recent report says that work related ailments due to work related stress is likely to cost India's exchequer around 72000 Crores between 2009-15 [2]. Though India is a fast developing country it is yet to create facilities to mitigate the adverse effects of work stress. The study of work stress in the member states of European Union (EU) points out that an average of 22% of the working Europeans experience work stress [3].

It is noted that work stress occurs among the employees at the context of work and at the content of work [4]. The potential stressors for these hazards in the context of work are organizational culture and function, role in the organization, career development, decision latitude and control, interpersonal relationship at work, work-home interface and change [4,5].

Studies on the employees perceptions and descriptions of their organizations, suggest three distinct aspects of organizational function and culture: organization as a task environment, as a problem solving environment and as a development environment [4]. The available evidence suggests that the organization is perceived to be poor in respect to these environments, will likely to be associated with higher stress.

Another major source of stress is associated with persons role at work. A great deal of research is done on role ambiguity and role conflict. It is found that role conflict and role ambiguity are instrumental in developing physiological disorders and says that the above factors can also lead to organizational dysfunction and decreased productivity [4]. Lack of expected career growth is one of main sources of work stress. The factors connected with this are poor promotion policies, job insecurity and poor pay in the organization [4].

Decision latitude and control are important aspects of work stress. These shows the extent which the employees are participating in the decision making process, and also shows the freedom given to the employees for choosing their work[4,6]. The number of research works points out the need of good relationship with superiors ,support from the superiors and support from the colleagues at work for the elimination of work related stress hazards[5,7].

Change is one of the most commonly found stressor at the context of work[8,9]. It is observed that changes in the modern work environment as result of technological advances, organizational restructuring and various redesign options can elevate the work stress [4].

Like context of work, content of work are also leads to work stress. These factors arise due to improper design of the task ,work load and workpace, and work schedule [4,5].There are several aspect of job content ,which are found hazardous and these include low value of work ,low use of skills ,repetitive work , uncertainty , lack of opportunity to learn, high attention demand , conflicting demand , insufficient resources [4].The research work shows that ,work related stress hazards arise due to meaning less task and lack of variety etc....It is also noted that most stressful type of work are those which have excessive demand and pressures that do not match with the workers knowledge and abilities [10].

The studies on the effect of work stress among men and women working groups in USA and found that due to high psychological work demands like excessive work load and time pressures leads to work stress and cause depression and anxiety in young working adults[11].

Two major factors responsible for work stress due to the improper work schedule are shift work and long working hours .The studies conducted in Italy among the shift workers observed that shift work leads to poor sleep and health related problems [12] Studies conducted among white collar workers in Sweden, points out that work stress is associated with men subjected to long working hours (75 hours/week) and it is shown that this leads to wide range of ill health in men and women[13].

## II. SUBJECTS

Total number of subjects selected for this study is 830 and the resulted sample consists of Engineers (75 Nos.), Supervisors (110 Nos.) and workers (675 Nos.). Participants selected for this study consists of both male

and female employees of age between 25 to 55 and had sufficient educational back ground for their job. All employees are permanent and working in shifts in rotation and each shift consists of 8 hour duration per day. However the majority of the employees, in these industries were males and number of woman participants is about 10% of the male participants. All the industries are chemical type, large scale and profit making public sector units for the last five years and located at different districts of Kerala, India. .

## III. METHODS

From the literature review and with the consultation of safety experts seven factors were identified for the evaluation of work stress in the absence of well defined factors for the evaluation of work stress in Kerala ,INDIA. They are demand, control, manger support, peer support, relationship, role and change. The final draft of the questionnaire had 35 items with seven subscales. All the questions were likert type with five fixed alternatives (always, often, sometimes ,rarely, never). In addition to this 10 demographic questions are also included in the questionnaire. This questionnaire was refined and validated further by means of confirmatory factor analysis (CFA)[14].This resulted in removal of five items from the questionnaire. The number of retained items in the questionnaire were demand (7 items), control (4 items), manager support (4 items), peer support (4 items),relationship (4 items), role (5 items) and change (2 items). The values of Comparative Fit Index (CFI), Tucker Lewis Index (TLI),and Cronbach alpha shows that the refined scale has good validity and unidimensionality in addition to reliability[14,15,16]. The analysis was performed by using the software AMOS-7 [17].The filled up schedules are then carefully edited for completeness, consistency and accuracy . The overall response rate was 81.3%.

## IV. RESULTS

### 4.1. Correlation Matrix

A correlation analysis between the variables /factors so identified was performed and the result of the analysis is given in the Table-1.It is noted that all the correlations were positive , but no significant correlation was found between the variable /factors (<0.5) .Therefore the variable selected for the study can be treated as independent variables for the purpose of research. The correlation analyses were carried out by means of SPSS-15.

Table 1 : Correlation between the factors

| Variables/<br>Factors | Demand | Control | Manager<br>support | Peer<br>support | Relationship | Role  | Change |
|-----------------------|--------|---------|--------------------|-----------------|--------------|-------|--------|
| Demand                | 1      | 0.354   | 0.249              | 0.240           | 0.310        | 0.214 | 0.196  |
| Control               | 0.354  | 1       | 0.279              | 0.227           | 0.310        | 0.168 | 0.251  |
| Manager<br>support    | 0.249  | 0.279   | 1                  | 0.426           | 0.319        | 0.313 | 0.357  |
| Peer<br>support       | 0.240  | 0.227   | 0.426              | 1               | 0.498        | 0.313 | 0.461  |
| Relationship          | 0.310  | 0.310   | 0.319              | 0.498           | 1            | 0.440 | 0.474  |
| Role                  | 0.214  | 0.168   | 0.313              | 0.313           | 0.440        | 1     | 0.353  |
| Change                | 0.196  | 0.251   | 0.357              | 0.461           | 0.474        | 0.353 | 1      |

#### .V. DISCUSSION

The main aim of the study is to develop and analyze the factors responsible for work stress among the employees in the chemical industries in Kerala, India. Accordingly seven factors were developed and the validity, and unidimensionality of the questionnaire

was analyzed by means of CFA and the overall reliability of the questionnaire was found satisfactory (>0.70). Interestingly it is found that the factors responsible for work stress is prominent in different categories of employees namely engineers, supervisors and workers in these industries(Table.2).

| Sl No        | Variables        | No.of items | CFI   | TLI   | Cronbach<br>alpha |
|--------------|------------------|-------------|-------|-------|-------------------|
| 1            | Demand           | 7           | 0.901 | 0.900 | 0.713             |
| 2            | Control          | 4           | 0.980 | 0.976 | 0.797             |
| 3            | Manager- support | 4           | 0.942 | 0.930 | 0.794             |
| 4            | Peer support     | 4           | 0.916 | 0.900 | 0.806             |
| 5            | Relationship     | 4           | 0.900 | 0.900 | 0.771             |
| 6            | Role             | 5           | 0.901 | 0.901 | 0.676             |
| 7            | Change           | 2           | 0.998 | 0.987 | 0.640             |
| <b>Total</b> | -----            | 30          | 0.934 | 0.927 | 0.748             |

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