

A Study Of Job Stress Level Among Engineering Professionals Working In Manufacturing Sector In India

Abhishek Y. Dikshit¹, Preeti A. Dikshit²

¹ Research Scholar [Management] Jain University Bangalore
“Shreevihar” Plot No. 50 R-H No.4 Green Park – Vidyanagari Rui-Baramati 413133
abhishek.y.dikshit@gmail.com, Mob. 9423501272

² Research Scholar [Commerce] Jain University, Bangalore
“Shreevihar” Plot No. 50 R-H No.4 Green Park – Vidyanagari Rui-Baramati 413133
preeti.a.dikshit@gmail.com, Mob. 9527439971

ABSTRACT

The current research investigated job stress among Engineering professionals aiming to measure the level of job stress and studying the relationship between job stress level of Engineering professionals and a) gender, b) age, c) work experience and d) stress management courses. The research was conducted among 236 Engineering professionals. The results suggest that stress reduction programs and strategies are inevitable due to high job stress levels. The relationship between stress level and gender, work experience, and stress management courses were approved through path analysis. Finally, implications of the study are discussed in terms of discussion and further research.

Key Words — Engineering professionals, Engineering personnel, Job Stress.

1. Introduction

Job stress has been a serious matter for employees, organizations and communities. The following costs of the problem are immense, and their effect on health and well-being is on the increase [1]. As Nareshrao [2] states, job stress is considered to be one of the primary work-related health problems, mainly in developed-countries where the phenomenon is well documented. Job stress -also called work stress, job stress or stress in organizations- “is a condition wherein job-related factors interact with the worker to change, either disrupt or enhance, his or her psychological or physiological conditions such that the individual's mind and/or body are forced to deviate from normal functioning” [3]. Job stress symptoms are not left in the workplace at the end of the workday, but remain with the human being to impact on to the broader psychosocial domain [4]. On the other hand, in the present work environment, one of the fastest growing workforces is the group of Engineering professionals. The number of personal computers around the world is close to one billion, but the number of Engineering professionals joining this field is declining fast. Indian Bureau of Labour Statistics estimated that about 1.6 million new Engineering professions would be created from 2004 to 2016 [5]. Engineering is also different from other conventionally male-oriented job fields like medicine and accounting where female participation is rising, whereas the number of women in the field of Engineering is dwindling [6], [7].

There has been little research on job stress among Engineering professionals. Some of the previous researches are shown in Table I. The question (Q) and hypotheses (H) of the current research are (Fig. 1):

- Q: What is the job stress level among Engineering professionals?
- H1: There is significant relationship between gender and the level of job stress.
- H2: There is no significant relation between age and the level of job stress.
- H3: There is significant relation between work experience and the level of job stress.
- H4: There is no significant relation between participants of stress management courses and their level of job stress.

The findings of the current research may be used to offer potential management strategies to attenuate the negative effects of job stress on engineering professionals.

Table 1 and Figure 1 (IS means : CNC Information Systems used in Manufacturing Industries.)

Main Research	Focus group	Reference
Investigating major sources of an IS professional's occupational stress	IS ⁺ professional	[8]
Studying stressors (found that social support helps to reduce the strains)	IS professional	[9]
Investigation of stressing factors on IS managers	IS managers	[10]
Sources of stress among IS managers	IS managers	[11]
Sources of stress among senior IS managers	Senior IS managers	[12]

⁺ IS: Information System

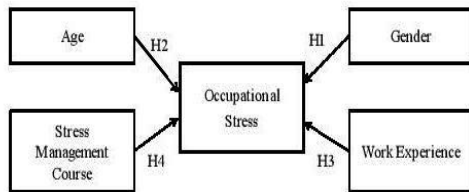


Fig. 1. The conceptual MODEL of the research

2. Research Methodology

2.1. Sample and Procedure

Respondents of the current study consisted of engineering professionals employed in the city of Pune, dealing with Manufacturing-related products and services. The standard job stress questionnaire was customized for the use of Engineering field by reviewing questions, obtaining experts' comments and literature review. Wherever possible, scales that operationalized constructs were adopted from past research. The customized questionnaire was initially pretested for content and face validity of questionnaire with 11BE, psychiatry, psychology and management professionals. Comments and suggestions obtained from the pretest served as a basis for re-designing items and the final presentation of the questionnaire.

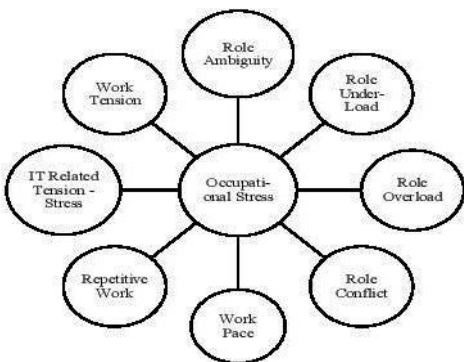


Fig. 2. Operationalized occupational stress model

2.2. Questionnaire

The instrument used in this study was electronic questionnaire in two types: email questionnaire (Microsoft Excel Format) and online questionnaire (Form-based). The questionnaire consisted of two parts: demographic questionnaire and job stress questionnaire. Respondents were asked to provide their demographic characteristics such as gender, age, education level, and work experience. The job

stress questionnaire consisted of 40 questions in nine categories (Fig. 2): role ambiguity, role conflict, role overload, role under-load, work pace, work tension, repetitive work and information technology. The possible responses are a five scale Likert from (1) I absolutely agree to (5) I absolutely disagree (Number 3 was neither agree nor disagree). Data were gathered in July 2010.

TABLE II: DEMOGRAPHICS OF THE RESPONDENTS

Variable	Number	Percent
Gender		
Male	94	39.8
Female	142	60.2
Age		
<25	43	18.2
26 to 30	104	44.1
31 to 35	37	15.7
36 to 40	38	16.1
41 to 45	9	3.8
46 to 50	0	0
>51	5	2.1
Work Experience (in years)		
<2	41	17.4
3 to 5	87	36.9
6 to 8	36	15.3
9 to 11	28	11.9
over 12	44	18.6
Passed Stress Management Course?		
Yes	20	8.5
No	216	91.5
Total	236	100

2.3. Statistical Analysis

A total of 236 questionnaires were included in the final analysis by SPSS version 15. The Cronbach's Alpha of the job stress questionnaire was 0.760. Respondents' demographics are shown in Table II. The analysis of total job stress among engineering professionals is demonstrated in Table III and Fig. 3.

TABLE III: TOTAL OCCUPATIONAL STRESS LEVEL

N	Valid	236
	Missing	0
Mean		130.1102
Std. Deviation		15.26045
Minimum		89.00
Maximum		177.00
Total Occupational Stress	40 to 79 (MiOS ⁺)	0 (0%)
	80 to 119 (MoOS)	61 (25.85%)
	120 to 159 (VSO)	164(69.49%)
	160 to 200 (ESO)	11 (4.66%)

⁺Mild Occupational Stress (MOS), Moderate Occupational Stress (MoOS), Very Stressful Occupation (VSO), Extremely Stressful Occupation (ESO)

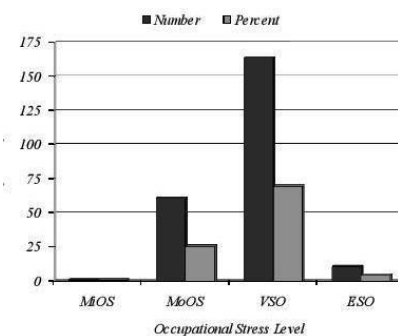


Fig. 3. Occupational stress level among IT professionals

3 Findings And Discussion

As it is shown in Table II, about 26% of respondents showed “moderate job stress”, 68% were having “very stressful occupation” and 5% had an “extremely stressful” occupation. The mean job stress levels of female and male professionals were 134 and 123 respectively. 91.5 % of respondents did not participate in stress management courses. About 70% of respondents were suffering from very stressful occupation (VSO) or extremely stressful occupation (ESO). This will give an idea about conducting stress reduction programs among engineering professionals. Considering confidence interval as 95%, work experience and age were investigated using a one-way analysis of variance (ANOVA) from which a Scheffe multiple comparison test was computed to pinpoint groups whose means were significantly different. An independent samples test was used for gender and stress management courses. Hypotheses are as follows (Table IV):

3.1. Hypothesis 1

Similar to previous researches [13]-[17], there is a significant relation between gender and level of job stress (Sig<0.05). The job stress level in female professionals is notably higher than that of male.

3.2. Hypothesis 2

Analysis revealed a significant relation between age and level of job stress among engineering professionals (Sig<0.05). Older professionals were suffering from higher job stress. Findings are similar to earlier researches [18]. [9]. In order to reduce stress levels of older employees, Sethi et.al [19] recommend that a formal and intensive re-training program may be used to leverage the experience of older employees and decrease their stress levels.

3.3. Hypothesis 3

A relation between work experience and level of job stress was found (Sig<0.05) Professionals with higher work experience were having higher job stress level. Sethi et al [19] found that experienced employees showed higher stress levels in the area of job security. In general, as the number of years in their current employment and also in the IS field increased, they became increasingly concerned about job security [19]. Nareshrao [2] investigated this relationship among Indian school administrators but reverse relationship was found.

3.4. Hypothesis 4

There is no significant relation between participants of stress management courses and their level of job stress (Sig>0.05). As table 3 showed, about 92% of the engineering professionals had not attended stress management courses which may affect hypothesis four results. Some researches in India showed that the level of stress was reduced for about one month after learning communication skills [20], [21]. However, this relation was not approved in the current research.

4 Further Research

It is recommended to researches to have deeper studies on the relationship between participants of stress management courses and their level of job stress. Due to findings of the current research and Nareshrao [2], investigation of relationship between work experience and level of job stress necessitates more researchers’ concern. Other demographic characteristics of IT professionals such as academic education, organization type (state, private, etc.) and income may be variables of job stress among engineering professionals.

TABLE IV: RESULTS OF THE HYPOTHESES OF THE RESEARCH

Hypothesis	Test	Significance
Gender (H1)	Independent Samples Test	0.024
Age (H2)	ANOVA	0.000
Work Experience (H3)	ANOVA	0.000
Stress Management Course (H4)	Independent Samples Test	0.271

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