

OCCUPATIONAL STRESS AND ITS IMPACT ON WORK EXHAUSTION – AN EMPIRICAL STUDY AMONG INFORMATION SYSTEMS PERSONNEL

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***Abstract:** Occupational stress has emerged as a crucial and pervasive issue in contemporary work life. Mounting research evidence proves beyond dispute that stress has a dysfunctional impact on both individual as well as organizational outcomes. This paper investigates using survey methodology the relationship between occupational stress and work exhaustion among information systems personnel. The study shows that certain stressors like fear of obsolescence, lacunae in training, work-family conflict and time pressure act as significant predictors of work exhaustion among information systems personnel. The study further showed that work exhaustion was high among information systems personnel who experienced more occupational stress, when compared to their counterparts who experienced lower levels of stress.*

***Keywords:** Information Systems, Stress, Work Exhaustion*

INTRODUCTION

Information Technology (IT) has emerged as one of the key strategic partners and enabler of organizational processes. The new era of digital economy is being shaped not only by the development and diffusion of computerization, but also by much cheaper and rapidly increasing electronic connectivity. The advent of the internet and e-commerce in particular is helping business enterprises to expand across national and geographic boundaries with more ease and speed. The surge in information technology and its application has led to an unprecedented increase in the demand for an IT workforce in IT development companies as well as in IT occupations in other industries. The spread of networked computers, the internet and the associated growing demand for high-quality digitized products and services have all resulted in an increase in demand for Information Systems (IS) professionals. India has fast emerged as a leader in the IT field (Gupta, 2001).

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India's leadership position in the global offshore IT industries is based on five main advantages: abundant talent; creation of urban infrastructure that has fostered several IT centers in the country; operational excellence that has delivered cost and quality leadership in offshore service centers; a conducive business environment including several favorable policy interventions such as telecom reforms; and continued growth in the domestic IT sector that provides enabling infrastructure and develops a broad-based skill base (NASSCOM-McKinsey, 2005). The Indian IT industry is on its path of continued growth and momentum. In an industry where talent acquisition and retention are the key to success, the behavioral and motivational issues confronting information systems employees needs to be probed and understood. Jobs in the IT industry, witnessed a steady rise from 1995 onwards. It is not surprising therefore that in a growing industry like IT; people issues should come under a scanner and take centre stage.

OCCUPATIONAL STRESS

The seventeenth century has been called the Age of Enlightenment; the eighteenth, the Age of Reason; the nineteenth, the Age of Progress; and the twentieth, the Age of Anxiety (Coleman, 1976). Thus, it is not surprising that the menace of stress and related problems has seen exponential growth in the twenty first century too. There cannot be any contention to the argument that stress is a concept which needs to be investigated, curbed and managed.

An increasing concern about stress appears to be well founded. Cost arising out of occupational stress to business enterprises and industry has been well documented in the recent past. Experts claim that stress-related disorders cost U.S. industry in excess of \$150 billion/year and that stress-related claims account for more than 14% of all insurance compensation claims (Pelletier & Lutz, 1991). The International Labour Organization (ILO) reported that inefficiencies arising from occupational stress may cost up to 10 percent of a country's GDP (Midgley, 1997).

Stress has been recognized as a major problem having serious implications on individual, organizational and societal health. According to Cooper and Payne (1988), mounting research evidence proves beyond dispute that stress has a dysfunctional impact on both individual and organizational outcomes. It is therefore not surprising that stress has taken concern as an epidemic, with focus at personal and organizational levels to decrease the amount of stress experienced. This amounts to the need for a better understanding of the nature and causes of stress.

Cooper and Marshall (1976) stated that, "*by occupational stress are meant negative environmental factors or stressors associated with a particular job*". Although these researchers certainly acknowledged other factors in the stress experience, their emphasis definitely was on the stressor itself.

OCCUPATIONAL STRESS AMONG IS PERSONNEL

The emergence of computer and information systems has been perhaps the single biggest factor impacting organizations and their functioning in the last few decades. The proliferation of computers and information systems in organizations has generated an increased demand for IS professionals to support technology-intensive transformations to compete successfully in a dynamic business environment.

Apart from this strategic initiative like reengineering, process redesign, restructuring as well as cycle-time reduction programs are all examples of organizational change efforts that have direct impact on the need for IT functions to meet the demands of the changing environment. Rapidly changing technology, dynamic computer networks, the growing need for technical support and integrated IT and delivery systems create a growing demand for cutting-edge IT services (Longnecker, Schaffer & Scazzero, 1999). As a result the information-processing industry has grown prolifically. With the information-processing industry growing rapidly over the last two decades, there has been an increasing requirement for software development to support the growth. Following the vast increase in the number of these engineers, the occupational health problems experienced by the engineers working in the software development have been emerging (Brod, 1984). In order to cope effectively with any trace of stress prevalent among IS employee stress, it is critical to know what job characteristics and conditions are associated with individual stress.

Studies have reported that work-related stress among Information Systems engineers who develop software is affected not only by rewards, human resource development, or role ambiguity (Saleh and Desai, 1986), but also by more task-specific work stressors, such as communication problems (Ivancevich, Napier, and Wether be, 1983, 1985), technical difficulties (Keenan and Newton, 1987), career development (Lim and Teo, 1999), role conflict, role ambiguity and role overload (Moore, 2000) and workload/time pressure (Li and Shani, 1991; Moore, 2000). Apart from this interpersonal issues like work-family conflict, were also reported as potential stressors by Lim and Teo (1996); and Rajeswari and Anantharaman (2003).

NEED FOR THE STUDY

Human resources form the backbone of the IT industry. Today there is perhaps no other industry more people dependent than the IT industry. Added to the regular resource management, unlike other industries, is the complexity of the human mind that forms the pillars on which this industry rests. The challenge is to nurture all these complex human minds and weave them into the fabric envisioned by the

leaders to reap the best benefits and lead to steady growth (Raina, 2006). Technical issues are not the only challenges that software development teams encounter; people issues and related problems arise when software is being developed (Pattit and Wilemon, 2005).

According to Aziz (2006), as the Indian IT organizations are growing up the value chain and going global, the biggest challenge would not be technology management but how to keep the workforce healthy. In the words of a clinical psychologist, “*The IT industry is a fertile ground for mental health problems*”. Its further added that the common physical problems in this industry are tiresome commuting to work, elastic working hours and a grueling schedule with unreasonable deadlines. Burnouts are increasingly common among IT professionals and their social relationships are in a mess (Parthasarathy, 2004).

The review of literature on occupational stress among IS personnel shows a paucity of research among this occupational group. The paucity of research on stress among IS personnel is surprising in light of both anecdotal evidence from newspaper/magazine articles as well as empirical evidence which focus and highlight the changing roles of IS personnel, particularly with reference to the Indian IT industry. Even among the few studies done, most of the studies have adopted stress measurement instruments commonly used among other occupational groups. Orlikowski and Baroudi (1989) state that IS workers are distinct with their own “*identity, attitudes, interests, collegueship, collective action, power, status and work consciousness*”. Hence the need for using an instrument specially developed to capture the stress experienced by information systems personnel is imperative.

OBJECTIVE OF THE STUDY

The main objective is to study the relationship between occupational stress and work exhaustion, among IS personnel.

RESEARCH HYPOTHESIS

Based on the research questions, the following hypotheses were formulated for the present study:

H1: *Occupational stressors among IS personnel are positively related with work exhaustion.*

H2: *Occupational stressors act as predictors of work exhaustion among IS personnel.*

METHODOLOGY

Methodology adopted for research is typically governed by the objectives of the research, the resources available and the constraints within which the research has to be conducted. These not only govern the methodology but also the sampling techniques adopted in the study as well. This research study has adopted a cross-sectional design and survey methodology. A structured questionnaire was developed to collect data under this study. Appropriate instruments were identified based on the variables, to frame the questionnaire for the study. A total of fourteen software companies located in Chennai city participated in this study. The software organizations that have participated in this study are those who are engaged in software development, which could range from software product development, systems integration, providing technology services or application development to architecting, developing and deploying complex business critical solutions, and providing end-to-end enterprise IT solutions to client organizations.

SAMPLING

This study used a combination of random and non-random sampling to collect responses from the IS personnel working in the metropolitan city of Chennai in India. The study has used several major and recent sources of company information to list the IS companies in Chennai and obtain other information related to the companies. They include the recent directories of the Confederation of Indian Industries (CII), the Confederation of Indian Industries – Southern Region (CII-SR), the internet and the CRIS-INFAC Software Industry Review.

Fourteen software companies which have established their development centers in Chennai were identified using purposive sampling for data collection. Six companies willingly came forward to participate in the study and data was collected through the HR of the companies. The stringent security measures and policies adopted by the IS companies made it difficult to virtually elicit co-operation and gain permission from the other eight software companies identified for the study. As a result, data was collected from these eight software companies using convenience sampling, a non-random sampling technique. The study retained a total of 635 responses, which includes a random sample of 380 responses and a non-random sample of 255 responses, for further analysis.

INSTRUMENTS USED IN THIS STUDY

Occupational Stress Scale

Occupational Stress Scale for Information Systems (OSSIS) personnel with 10 dimensions and a total of 52 items in it was specifically developed for this study.

The sub-scales of the OSSIS along with the number of items in each dimension is given here - fear of obsolescence (5), lacunae in training (5), lack of leadership support (6), disharmony in team (9), work-family conflict (5), career plateau (3), time pressure (6), problem solving demand (5), role overload (4), and technical constraints (4). Respondents were instructed to rate each of the items according to the intensity of negative pressure that they felt due to them using a 7 point scale anchored from 'very low intensity' to 'very high intensity' and the responses to items are scored from 1 to 7 respectively.

Work Exhaustion

The work exhaustion construct in this study was measured using the Maslach Burnout Inventory (MBI) developed by Maslach and Jackson (1982). Five items were chosen from the MBI and used in this study. The scale was rated on a 7-point basis and the corresponding scores are given within parenthesis: - never (0), almost never- a few times a year or less (1), rarely- once a month or less (2), sometimes- a few times a month (3), rather often- once a week (4), nearly all the time- a few times a week (5) and daily (6).

PILOT STUDY

Pilot study to pretest the questionnaire was done by collecting responses from 30 IS professionals working in two IT companies in Chennai. Reliability and validity of the instruments used for the study was established by statistically analyzing the data on SPSS 18.0 package.

RELIABILITY

Internal consistency of the instrument used in this study was established using the Cronbach's Coefficient. The values of Cronbach's Alpha for all the constructs in this study were 0.7 and more.

RESULTS

The comparison of the mean scores of the various occupational stressors revealed that time pressure was the highest source of stress among IS personnel with a mean of 3.94, closely followed by career plateau (mean= 3.93), fear of obsolescence (mean= 3.85), work-family conflict (mean= 3.82) and problem solving demand (mean= 3.80). This was followed by lacunae in training (mean= 3.78), role overload (mean= 3.71), lack of leadership support (mean= 3.57) and disharmony in team (mean= 3.56). Technical constraint was the least potent stressor with a mean score of 3.52.

Correlation

The composite score of all the stressors along with the overall stress were correlated with organizational commitment. A two- tailed t-test was used to identify the significant correlations. The results showed that positive correlation exists between each of the ten occupational stressors and work exhaustion. All the correlations were found to be positive and statistically significant at $p < 0.01$. Time pressure had a score of 0.42 ($p < 0.01$), work-family conflict showed a correlation score of 0.33 ($p < 0.01$) and technical constraints had a score of 0.32 ($p < 0.01$).

ANOVA ANALYSIS

Based on the median split of the overall stress scores, IS personnel were classified as falling under low stress, moderate stress and high stress groups. ANOVA was conducted in order to analyze if there were any differences in the work exhaustion of the IS personnel experiencing different levels of stress. Table 2 indicates that the work exhaustion was highest among IS who experience high stress. With increase in stress experienced, work exhaustion among the employees also increased. The differences in mean scores of work exhaustion among IS personnel experiencing different levels of occupational stress were found to be statistically significant ($p < 0.01$). While the mean score of work exhaustion was found to be 8.29 among IS personnel with low stress, there was an increase in the mean score of work exhaustion to 12.18 among IS personnel who exhibited moderate stress and the work exhaustion mean score further increased to 13.72 among the highly stressed personnel. It can therefore be inferred that there is a significant difference in the work exhaustion of IS personnel who experience different levels of occupational stress.

Table 1
Correlation between stressors, overall stress and work exhaustion

	1	2	3	4	5	6	7	8	9	10	11	12
1. Obsolescence	19.25 (5.97)											
2. Training	0.68	18.89 (6.50)										
3. Leadership	0.64	0.76	21.44 (8.23)									
4. Team	0.71	0.79	0.84	32.07 (12.01)								
5. Work-Family	0.61	0.54	0.56	0.59	19.08 (7.36)							

6. Career	0.55	0.67	0.70	0.67	0.48	11.80 (4.22)						
7. Time Pressure	0.69	0.64	0.64	0.67	0.76	0.59	23.66 (7.36)					
8. Problem Solving	0.78	0.61	0.61	0.67	0.66	0.49	0.73	19.02 (6.06)				
9. Role Overload	0.76	0.66	0.61	0.73	0.59	0.56	0.71	0.69	14.87 (5.35)			
10. Technical	0.72	0.70	0.68	0.75	0.59	0.56	0.67	0.73	0.75	14.09 (5.04)		
11. Overall Stress	0.85	0.85	0.86	0.91	0.77	0.74	0.85	0.83	0.84	0.85	194.25 (57.46)	
12. Work Exhaustion	0.26**	0.30**	0.25**	0.28**	0.33**	0.26**	0.42**	0.31**	0.30**	0.32**	0.36**	11.39 (6.55)

Note: N= 635; *p < 0.05, **p<0.01; Mean and S.D are presented along the diagonal

Table 2
ANOVA test result for occupational stress and work exhaustion

<i>Stress level</i>	<i>Mean</i>	<i>S.D</i>	<i>F</i>
Low Stress	8.29	5.91	
Moderate Stress	12.18	5.36	43.87*
High Stress	13.72	7.05	
Total	11.39	6.55	

Note: N= 635; * p < 0.01 level of significance

Regression Analysis

The correlation matrix of Table 1 suggests that some of the independent variables are highly correlated indicating possible multicollinearity. In order to identify the existence of multicollinearity two methods were used 1) variance inflation factor (VIF) and tolerance 2) coefficient variance-decomposition analysis with condition indices. Using the above two methods it was ascertained that multicollinearity does not exist in this model. Multiple regression analysis was then carried out to explore the relationship between the stressors and work exhaustion. Table 3 gives the results of the analysis. Exhaustion develops early in the burnout process and reflects lack of energy and the feeling that one's resources are depleted and consequently the work life of the employee gets affected (Cordes and Dougherty, 1993; Leiter and Maslach, 1988; Toppinen-Tanner, Kalimo and Mutanen, 2002). In the current study multiple regression analysis was carried out to study the

relationship between the occupational stressors and work exhaustion. Of the ten occupational stressors entered as independent variables, four stressors- fear of obsolescence ($p < 0.01$), lacunae in training ($p < 0.01$), work-family conflict ($p < 0.01$) and time pressure ($p < 0.01$) emerged as the significant predictors of work exhaustion. The beta scores signify the positive relationship between work exhaustion and each of the predictor variables. The higher the stress levels of the IS personnel, the more exhausted they feel. This led to partial acceptance of hypothesis H2.

Table 3
Regression analysis with work exhaustion as dependent Variable

Model	Cumulative Model	R	R ²	Adjusted R ²	Change Statistics		Beta
					R ² Change	F Change	
1	(Constant), Obsolescence	0.271	0.073	0.072	0.073	49.942**	0.162*
2	1+ Training	0.315	0.099	0.096	0.026	18.126**	0.121*
3	2+ Family	0.374	0.14	0.136	0.041	29.787**	0.102*
4	3+ Time	0.442	0.196	0.191	0.056	43.490**	0.417**

Durbin-Watson statistic= 1.443;* $p < 0.05$, ** $p < 0.01$; Excluded Variables- lack of leadership support, disharmony in team, career plateau, problem solving demand, role overload and technical constraints

DISCUSSION

Research has found positive relationships between all forms of stress and exhaustion (LePine, LePine and Jackson, 2004). The present study affirms this relationship. A positive relationship has been found between each of work exhaustion and each of the predictor variables (stressors). Cooper *et al.*, (2001) tried to explain this relationship to be a consequence of the elevated levels of arousal and information processing associated with the desire to understand and cope with the demands of an ongoing situation. Many studies have presented exhaustion as the core component and the central quality of burnout (Koeske and Koeske, 1989; Shirom, 1989; Moore, 2000). Symptoms like feeling restless and unable to concentrate, feeling irritable and tense, feeling tired and having low energy that are commonly associated with work exhaustion were reported by IS managers (Weiss, 1983). Thus the presence of work exhaustion in the IS organizational set up has raised considerable concern and has been studied earlier (Kalimo and Toppinen, 1995;

Moore, 2000; Sethi *et al.*, 1999; Weiss, 1983). Kalimo and Toppinen (1995) in their study on IS/IT personnel found that approximately one-fourth of the subjects –felt used up at the end of the work day, felt fatigued when they got up in the morning to face another day on the job and felt they were working too hard on their job. Work exhaustion has been found to be prevalent among software professionals (Rubin and Hernandez, 1988; Moore, 1998; Moore, 2000) and in particular among software developers working in the IT industry (Sonnentag *et al.*, 1994).

Sethi *et al.*, (1999) in their study focused on exhaustion among IS personnel and treated it as synonymous with burnout. The study reported a strong positive correlation between role stressors and exhaustion. While the study by Sethi *et al.*, (1999) has focused exclusively on the role stressors, the present study has probed other stressors too and was able to find stressors like fear of obsolescence, lacunae in training, work-family conflict and time pressure to be significant predictors of work exhaustion. It is to be noted that role overload did not emerge as a significant predictor of work exhaustion in this study.

Moore (2000) reported role overload, role conflict, role ambiguity and interpersonal conflict as antecedents of work exhaustion among IS/IT professionals. In line with this we find in the present study that work-family conflict and time pressure as predictors of occupational stress among IS professionals. The 24X7 work culture arising from the need to cater to the requirement of clients in different time zones, the pressure of honoring the deadlines of the project and the unrealistic project schedules often put undue time pressure on the IS professionals. The inability to balance the work-family demands often adds to the woes of the IS professionals. Consequently the IS professionals could feel used up, fatigued and exhausted. Added to these is the constant need to stay updated with the current technological advancements and when no adequate training available to support the learning and development, the employees can feel exhausted.

CONCLUSION

The research study has found a positive relationship between occupational stress and its dimensions with work exhaustion. IS personnel with high levels of stress have been found to more exhausted when compared to their counterparts experiencing moderate and high levels of stress. Four occupational stressors- fear of obsolescence, lacunae in training, work-family conflict and time pressure emerged as significant predictors of work exhaustion among IS personnel. Occupational stress has to be kept at an optimal level in order to prevent the employees from getting exhausted at work.

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