EXPLORATORY STUDY ON OCCUPATIONAL STRESS IN IT / IT SUPPORT PERSONNEL – A HUMAN RESOURCE PERSPECTIVE

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ABSTRACT

Occupational stress is a term generally used to define ongoing stress that is related to the workplace. The stress may have to do with the responsibilities associated with the work itself, or may be caused by conditions that are based in the corporate culture or personality conflicts. Occupational Stress is also referred as Job Stress or Work Stress. Occupational stress among IT / IT Support personnel is measured in terms of its manifestations, namely, Health Disorders (physical and psychological such as diabetes, nervous breakdown, sleeplessness, depression), Lifestyle Disorders (late night partying, investment in gadgets, garments and accessories for making life style statement, risky investments in assets such as vehicles or property beyond ones purchasing power), and Behavioral Strains (increased smoking, alcohol abuse, drug abuse). Stress among IT and IT support professionals have been attributed to a number of factors or Stressors. From the literature reviewed we see that the factors (independent variables) that contribute towards stress (dependent variable) include 'macro' and 'micro' level factors. While the macro level factors relate to the wider social, economic and political influences, the micro level factors are 'Organizational variables ' or 'Organizationally Valued Variables,' 'Personally Valued Variables,' 'Demographic variables,' and 'Socio-Cultural Variables.' This study aims to evolve a conceptual framework for studying occupational stress and its causes among employees in IT/IT support Industries in Chennai city. Also a Research instrument for measuring occupational stress is attempted with the help of Factor analysis.

Keywords*: Occupational stress, Health Disorders, Lifestyle Disorders, Behavioral Strains, Stressors*

Introduction:

Occupational Stress or Work Stress manifests in many occupations across the globe. But mainly human service oriented professions requiring more human interaction and attention like nursing, teaching, counseling and others have been mainly studied, as such professions have exhibited extreme levels of occupational stress. According to Benach J. et al., (2007), existing studies has predominantly focused on the complex inter-relationship between mental health and work productivity only in developed countries. In developing countries like India the need for such studies is necessary in upcoming fields of Information technology where more personnel are employed in delivering services towards their internal customers (immediate superior, peers) as well as external customers. The job demands and stringent deadlines in IT organizations have put extreme levels of occupational stress in specific cases. There is a twofold perspective in studying the phenomenon of Occupational Stress in IT personnel. Firstly we need empirical evidence whether Occupational Stress exists in IT industry. Secondly we need to identify the possible causes of Occupational Stress. Though the study is from a Human resource perspective, an interdisciplinary approach is adopted in our study on Occupational stress in IT personnel since the theory of occupational stress cuts across varied areas of physiology, psychology, sociology, organizational behavior and so on.

Nature of It Population:

Broader Classification of the Study Population:

Core Information Technology (IT) industry means organizations which are directly involved in development of IT products like IT software, IT hardware and also involved in the maintenance of the developed IT products. Information Technology Enabled Services (ITES)/ Business Process Outsourcing (BPO) industry implies organizations which are not directly involved in the development of IT products. Such organizations make use of developed IT products like software across varied business domains. High technical skill set is not necessary for ITES / BPO personnel, rather specific aesthetic requirements of handling customers like voice modulation,

quick responses, recording of specific data from customer complaints, faster hand movements, typing skills, etc… are key to the skill set requirements of ITES / BPO personnel.
In our study we focus ourselves on IT personnel who are directly involved in the development and support of IT products i.e., IT & IT support personnel alone, based on the above understanding of the population nature in IT industry. The paradigm of discussion and factors affecting occupational stress differ widely based on the choice of the IT population strata or category.

Literature Review:

Occupational Stress Models & Causes:

Seyle (1976) in one the earliest attempts to scientifically explain the process of stress-related illness created the three-stage model termed the General Adaptation Syndrome (GAS). Cartwright & Cooper (1997), criticized Selye's work on the basis that it ignored the psychological impact on the individual and also the individual's ability to change the situation after recognizing the stress. In the 1970s, Lazarus (1966) suggested that an individual's stress reaction "depends on how the person interprets or appraises (consciously or unconsciously) the significance of a harmful, threatening or challenging event."Harrison (1978) in the person-environment (P-E) fit theory of stress emphasized that there are two kinds of fit between an individual and their environment.

Occupational Stress – Symptoms:

Most researchers agree that strains can be classified into three major types: psychological, physical, and behavioral. Harrison et al., (1978) posed that strain referred to the deviation from normal responses. Similarly, in their review of occupational stress, Downs, Driskill and Wuthnow (1990) note that the experience of stress has been related to the psychological areas of depression, fatigue, low self-esteem, anger, apathy, irritability, guilt, moodiness, boredom, accidents, withdrawal and burnout. The second major strain resulting from exposure to stressors is that of physical strain (also referred to as physical health). Downs et al. (1990) outlined in their review that stress has been physically related to cardiovascular disease, hypertension, ulcers, asthma, and migraine headaches. Finally, the third classification of strain is that of behavioral strain. Research has associated increased cigarette smoking, increased alcohol and recreational drug abuse, violence, stuttering, overeating, and frequent utilization of health care services as symptoms of behavioral strain (Harrison, 1978)

Literature on Studies related to IT professionals:

In a study, by Ganesh Aarthi, John Sujit, Kannapan Yamini, Meena. V (2007), it was found that with increasing number of multinational companies India is preferred as their favorite destination for outsourcing operation. In a study by Sushma Suri and Saba Rizvi (2008) aimed to find out the stress and mental health among call center employees, results revealed that significant difference in stress and mental health observed with respect to both genders from domestic call center. In a study on Multi National Company (MNC) executives by Madhu Anand and Dipti Arora, (2009) working in the same company for very long time may cause Burnout and Monotony to the executives.

Study 1: Evolving A Conceptual Framework For Studying Occupational Stress In It / It Support Personnel

Objectives of the Study 1:

- To evolve a conceptual framework for the study on occupational stress in IT and IT support personnel.

Methods / Tools Used:

Primary Data was collected from the study population and the following data collection methods and tools were used.

Focus Group Interview:

15 Focus group interviews were conducted with open ended questions on issues relating to occupational stress in IT industry. Based on the inputs from Focus group interviews the conceptual framework and research instrument on occupational stress measurement is attempted by blending scholarly literature, research and industry critics. Focus groups comprised of mainly IT professionals, Senior HR executives, medical doctors and subject experts.

Conceptual Framework:

The causes of Stress or stressors discussed in most empirical studies are based on the "Job-Demand-Control-Support" (JCD-S) model and the "Effort -Reward-Imbalance and Over commitment" (ERI-O) model. According to the JCD-S model (Karasek 1979), high level of job demands (time pressure, work pace, deadlines), combined with a low level of job control (influence over own work, possibilities for learning new things or decision latitude) and low levels of social support can be considered as stressful working conditions. The ERI-O model (Siegrist 1997 and 1998) is complementary to the JCD-S model. In this model, chronic work-related stress is defined as non –reciprocity or imbalance between high efforts spent at work (extra hours, personal investment) and low rewards (esteem, promotion, respect, salary) received.

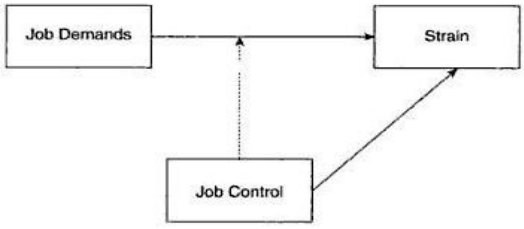

Fig.1 – "Job-Demand-Control-Support" (JCD-S) model, Karasek (1979)

Stress among IT and IT support a professional has been attributed to a number of factors. From the literature reviewed and focus group interview inputs we see that the factors (independent variables) that contribute towards occupational stress (dependent variable) include 'macro' and 'micro' level factors.

Dependant Variable:

In this study the dependant variable studied is occupational stress.

Occupational Stress:

Occupational stress is operationalized as ongoing strain that is related to the workplace, which causes imbalance in the lifestyle, behavioral, psychological or physical well being of the employee. The manifestations or symptoms of stress are lifestyle disorders, health disorders, and behavioral strains. Occupational stress shows itself in these manifestations and hence measured therein. Occupational stress is measured in terms of its manifestations, namely, Health Disorders (physical and psychological such as diabetes, nervous breakdown, sleeplessness, depression), Lifestyle Disorders (late night partying, investment in gadgets, garments and accessories for making life style statement, risky investments in assets such as vehicles or property beyond ones purchasing power), and Behavioral Strains (increased smoking, alcohol abuse, drug abuse).Occupational stress is categorized into three level , referred as 'Level of Stresses' namely, 'High Stress,' which is a highly stressed state manifesting itself in the worse cases as a burnout, or nervous breakdown. 'Medium/Moderate Stress' which may include symptoms that are manageable and 'Low/Mild Stress,' which is a normal state of work related stress. Therefore occupational stress is measured in the raw format as an interval variable and is subsequently classified into an ordinal variable.

The extra contribution from our study to evolve a conceptual framework of occupational stress is that past studies did not indicate lifestyle disorders, rather inputs from focus group interviews strongly project lifestyle disorders as another important symptom of Occupational stress in IT and IT support personnel.

Independent Variables:

The independent variables employed in the present research study to find out if they have an impact on the dependant variable 'occupational stress,' are as under,

A. On the micro level,

i. Organizational Variables or Organizationally Valued Variables - These are organization specific factors and include,

a) 'Organizational Characteristics,' includes, corporate governance, legality of business, job role definition and clarity, work flow, co-worker absenteeism, appropriate staffing, appropriate infra-structure facility, sexual harassment prevention policy and redressal system, staff skill training and development scheme, stress interventions available in organizations, salary and benefits, and daily conveyance/ transport to and from work site.

b) 'Occupational/ Work Characteristics,' includes risk factor, work load factor, work satisfaction factors, and absence of role ambiguity factors. These reflect on conditions relating to long working hours, work over load, frequently changing shifts system, input raw material stock demand, lack of business order for processing, seasonal business, demanding client interaction, and frequent travel.and

c) 'Stress generating happenings in particular encounters.' These reflect conditions relating to over demanding and discriminating supervisor or reporting boss, harassment by reason of gender caste community or regionalism, showing favoritism, nepotism, denial of bonus, denial of salary, denial of leave, denial of promotion and denial of increments.

ii. Personally Valued Variables- These are individual specific factors and includes reflections on marriage conflicts, family problems, experience on the job, job satisfaction, perception of self in relation to the organization, belief in locus of control, self-efficacy, ambition level, hostility level, social support, and personality.

iii. Demographic Variables include sex, age, family type, education, income, family income, number of working members in the family, and residency in own dwelling.

iv. Socio–Cultural Variables include unauthorized external political or other power center interference in the employee job, family bonding, social/cultural values, belief in religion, and supporting aged parents.

B. At The Macro Level

Recession alone is included as an independent variable. Recession is a major relevant factor now as the world economic order is hit by recession. Recession is intense in the USA and Europe from where the bulk of IT service and support orders come to India. Therefore recession is included as a macro level variable to understand its impact on occupational stress.

Conceptual Model of Stress for Testing:

The Model of Stress that is examined in this study is given as under. The model (Fig.2) indicates the potential causes and manifestations of Occupational Stress under various heads.

Construction of occupational stress measurement scale:

Occupational Stress is operationalized as the sum of health disorders, behavioural strain and lifestyle disorder. Taking into account these theoretical dimensions, a post-test scale on occupational stress was constructed with 31 items initially. From these dimensions using factor analysis the final scale is constructed in study 2 reducing the number of items in questionnaire to 15 items (refer appendix – Final

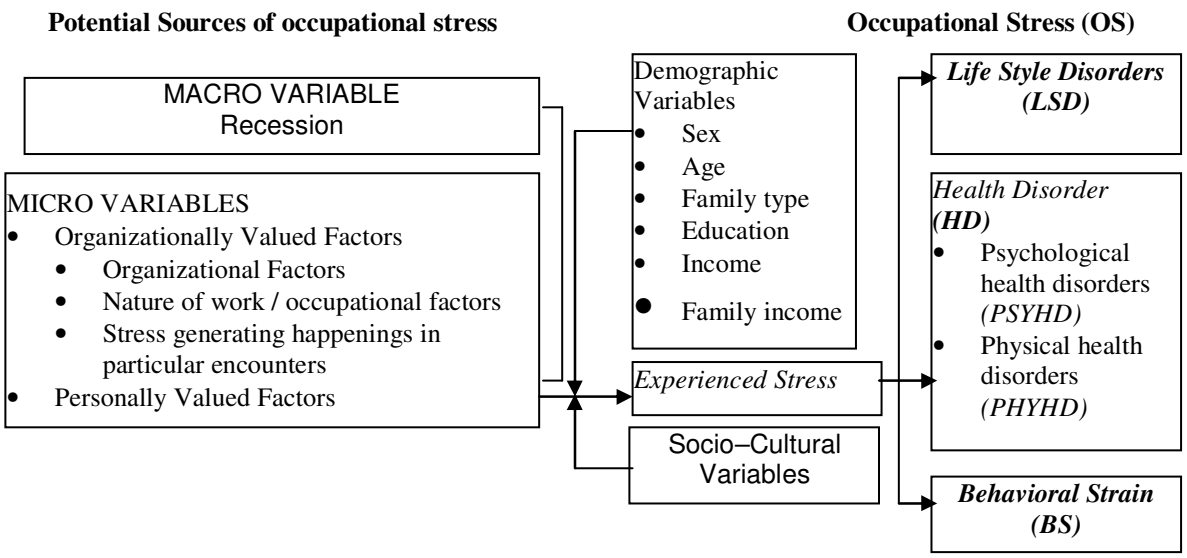

Fig.2 Conceptual Model of Stress

version of questionnaire). One item being common to both behavioural stress and lifestyle disorder (item No. 26 / Jumbled item no.13 of the post test scale).

Scoring of the Occupational Stress Measurement Scale:

The scoring was done by applying a five point Likert type scaling procedure with some of the items being positive and some being negative and the answer choices always ranged from 'strongly agree' 'agree' 'cannot say'/neutral 'disagree' and 'strongly disagree'. Answers favouring the dimension measured were given higher points and those disfavouring were given minimum points. The maximum score was '5' and the minimum was '1'. The theoretical dimensions were expressed by unequal number of items.

STUDY 2: Factor Analysis & Measuring Occupational Stress

Objectives of The Study 2:

- To refine the research instrument for measuring Occupational Stress level in IT and IT support personnel.
- To measure the Occupational Stress level in IT and IT support personnel.

Methods / Tools Used:

Primary Data on demographic information of IT personnel as well as occupational stress symptoms using the initial version of questionnaire developed in study 1 was collected from the study population and the following data collection methods and tools were used.

Questionnaire Survey:

Pilot data is collected based on questionnaire distribution to IT and IT support personnel. Preliminary factor analysis is done to reduce the number of factors and items in the questionnaire based on factor loading.

Sampling Methodology: Stratified Random Sampling:

Universe:

The Universe of the population consists of IT & IT support personnel in the IT organisations of Chennai, India.

Sampling Frame / Primary Sampling Units:

The sampling frame for the study consists of approximately 150 Chennai IT companies listed in the NASSCOM registered list of core IT companies. Ideally 15 companies (10% of sampling frame) were selected at random, out of which only 11 companies agreed to support the survey.

Secondary Sampling Units:

The secondary sampling units consist of actual IT personnel working in these 11 homogenous clusters namely the companies. The data collection in these companies was done such that data was collected sufficiently representing all strata of population. Random number generator tools were provided to administrative staff and random number tables were for making the random sampling in respective strata of the IT personnel working in the respective companies. For example if 30 is the secondary sample size of a company of 300 IT personnel strength, out of the 30 sampled units or respondents, 21 (70%) employees were selected randomly from lower level (Beginners, Fresher, Developers, Junior Testers) of the strata, 6 (20%) from middle level (Project Managers) and 3 (10%) from top level (Consultants, Architects) of hierarchy.

Sample Size:

The final *sample size* based on multi stage stratified random sampling was ***483.***

Table 1 - Results of Factor Analysis for Factor I-Health Disorder

Eigen Value = 12.384, % of variance = 42.702, Significance = .001

S.No	*Item No. (in pilot study questionnaire)*	*Contents*		*Factor Loading*
		Theoretical	*Empirical*[1]	
1.	Item 12	HDPhy	HD	0.772
2.	Item 16	HDPsy	HD	0.811
3.	Item 17	HDPhy	HD	0.716
4.	Item 19	HDPsy	HD	0.743
5.	Item 30	HDPhy	HD	0.742

Table 2 - Results of Factor Analysis for Factor II-Behavioural Strain

Eigen Value = 1.842, % of variance = 6.353, Significance = .001

S.No	Item No. *(pilot study questionnaire)*	Contents		Factor Loading
		Theoretical	Empirical	
1.	Item 1	BS	BS	0.536
2.	Item 4	BS	BS	0.577
3.	Item 8	BS	BS	0.622
4.	Item 11	BS	BS	0.613
5.	Item 13	BS/LSD	BS	0.508

Table 3 - Results of Factor Analysis for Factor III- Life Style Disorder

Eigen Value = 1.482 , % of variance = 5.110, Significance = .001

S.No	Item No. *(In pilot study questionnaire)*	Contents		Factor Loading
		Theoretical	Empirical	
1.	Item 3	LSD	LSD	0.513
2.	Item 5	LSD	LSD	0.589
3.	Item 7	LSD	LSD	0.813
4	Item 10	LSD	LSD	0.625
5	Item 15	LSD	LSD	0.596

Random Number Generator Tool:

Source: http://stattrek.com/tables/random.aspx

Random number generator software tool was used to generate a table of random numbers. The employee identification number was used as a reference point and random numbers were generated by specifying a range to arrive at the list of random numbers.

Factor Analysis of Occupational Stress Measurement Scale:

Using the data consisting of the subjects scores on the 31 items, factor analysis was employed, namely, the principal component method. A total of 3 factors were extracted using the appropriate standard procedure. This was then rotated into the VARIMAX position. Analysis of the projections of items on factors showed the existence of 3 logical dimensions, others being too specific or unidentifiable. The empirical fitness of the items for measuring the dimensions was determined. The tables below present the results of the analysis. Three factors were derived from the application of factor analysis. They are discussed below based on the factor loadings.

Factor I – Health Disorder (HD):

From the above table 1 we can infer that in this factor though theoretically 11 items were conceived, 5 items were empirically present and taken into consideration for further testing. This factor explained the notion of occupation stress by about 42.7%. This factor which was theoretically conceived as Health Disorder - Physical and Health Disorder - Psychological. It has been named as 'Health Disorder' and it is a combination of the above two. The aspects under this factor are,Item 12 – Disturbed sleep due to job - HDPhy, Item 16 – Depressed due to job - HDPsy, Item 17 – Job gives nervous breakdown – HDPhy, Item 19 – Job / Work often makes feel angry – HDPsy, Item 30 – Feeling of high blood pressure at the workplace – HDPhy.

Factor II - Behavioural Strain (BS):

Items included under this factor clearly revolve around the dimension BS (Behavioural Stress). This factor consists of 5 items, six less than the theoretically assumed 11 items. Again some factors from LSD loaded here. Mostly this factor has been labelled as 'Behavioural Stress' (BS). This factor mostly represents, Item 1 - Relaxing by eating junk food. – BS, Item 4 – Smoking as destressor between jobs – BS, Item 8 – Having sex outside marriage – BS, Item 11 – Consuming Liquor as destressor of work pressure – BS, Item 13 – Indulging in eating sprees – BS/LSD

Factor III - Life Style Disorder (LSD):

Instead of the theoretically conceived 9 items only 5 items loaded appropriately. The Lifestyle disorder factor represents, Item 3 – Work culture to invest in latest IT gadgets – LSD, Item 5 – Corporate culture requires wearing of branded garments. – LSD, Item 7 – Making of lifestyle statements through personal appearance. – LSD, Item 10 – Indulging in late night partying in holidays. – LSD, Item 15 – Indulging in risky investments when it comes to property – LSD.

Results & Discussion:

Based on the basic descriptive statistics worked out for the surveyed data of IT personnel, some of the key indicators are explained. The average age of the surveyed IT and IT support personnel is found to be $\mu = 28.86$. The minimum income per month of the IT personnel surveyed starts from Rs.20, 000 /- to Rs.1, 00,000 /-. The average income level is found to be μ = Rs.41, 018.63. The standard deviation of the income per month is found to be σ = Rs.14, 723. 79. The number of working hours of IT and IT support personnel lie in the range of 10 to 12 hrs per day, with μ = 11.15 hrs / day. The number of Customer calls handled per day is an average of $\mu = 30$. The spread of IT personnel in the surveyed data is found to be mainly involved in Banking & Finance domain. 336 respondents (69.6%) surveyed are junior level employees, 123(25.5%) respondents are middle level employees, followed by senior level employees (5%).

Effect of Total Occupational Stress Score:

The Final scale on measuring the level of Occupational Stress in IT and IT support personnel consists of 15 items. There are 5 items corresponding to measurement of Behavioral strain, Lifestyle disorder and Health disorder each respectively. And there is one concurrent item with respect to Behavioral strain and Lifestyle Disorder in these 15 items The Actual range of score and midpoint score of occupational stress is found as below.

Range:

Number of Items x Min Score **to** Number of Items x Max Score.

Mid Point:

[Number of Items x Min Score **to** Number of Items x Max Score.] / 2

Total Occupational Stress Score (5 point Likert scale):

Range:[5 items] x 1 = **(5) to** [15 items] x 5 = **(75)** & **Mid Point:** 37.5

The notion on any measuring scale is that, when actual measured mean is less than scale midpoint then the measure is less and if the actual measured mean is more than the scale midpoint then the measure is high. Based on this understanding of measurement of indicating high and low levels of Occupational stress we find mixed responses in the final empirical data.

Null Hypothesis (H_0):

There is no high level of Occupational Stress in IT personnel

Alternate Hypothesis (H_1):

There is high level of Occupational Stress in IT personnel
Initially it is assumed that there is no high level of Occupational Stress in IT and IT support personnel. From the surveyed data we find that the Total Occupational Stress mean score (μ = 49.8977, IT personnel, μ = 46.6986, IT support personnel) is found to be well above the midpoint score (37.5) of the measuring scale. The null hypothesis is rejected and hence it can be concluded that the level of Occupational Stress is high in IT and IT support personnel.

Conclusion:

The reliability of the occupational stress measurement scale through Spearman Brown coefficient was 0.83. Hence this scale is reliable, in spite of the methodological limitations of factor analysis. The above constructed scale (with the three dimensions) has a total variance = 54.16. The value indicates that 54.16 percent of the phenomenon of Occupational Stress is explained by this questionnaire. The scope of further study can be attempted to find out if the independent variables are associated to occupational stress. As we have developed a scale for assessing the level of Occupational stress, another scale can be developed to identify the causes of occupational stress.

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APPENDIX - Occupational Stress measurement instrument – Final Version

Fin No	S. No	Old S. No	Statement	Concept measured	Strongly Agree	Agree	Cannot say/ neutral	Disagree	Strongly Disagree
1	1	9	I often relax by eating some junk food.	BS	5	4	3	2	1
2	3	1	It is our work culture to invest in the latest gadgets.	LSD	5	4	3	2	1
3	4	22	To de-stress I often smoke between jobs	BS	5	4	3	2	1
4	5	2	Our corporate culture requires that I wear the best of branded garments.	LSD	5	4	3	2	1
5	7	3	In our work culture it is important to make life style statements through our personal appearance	LSD	5	4	3	2	1
6	8	23	Having sex outside marriage is a common behavior in our culture.	BS	5	4	3	2	1
7	10	4	On holidays days I indulge in late night partying	LSD	5	4	3	2	1
8	11	24	After work I de-stress by drinking liquor	BS	5	4	3	2	1
9	12	19	I have a disturbed sleep because of my job.	HD Phy	5	4	3	2	1
10	13	26	I indulge in eating spree	BS/ LSD	5	4	3	2	1
11	15	5	I indulge in risky investment when it comes to property	LSD	5	4	3	2	1
12	16	14	My job depresses me.	HD Psy	5	4	3	2	1
13	17	20	My job gives me almost a nervous breakdown.	HD Phy	5	4	3	2	1
14	19	13	My work often leaves me feeling angry	HD Psy	5	4	3	2	1
15	30	18	My job makes me feel like my blood pressure is always high.	HD Phy	5	4	3	2	1

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