Occupational Stress: An Analysis

Dean Elmuti
Eastern Illinois University
Charleston, Illinois

Yunus Kathawala
Eastern Illinois University
Charleston, Illinois

Sudhir Chawla
Angelo State University
San Angelo, Texas

Introduction

Stress is a part and parcel of modern day life, but the stress in the workplace has become a major contributor to many diseases in the modern industrial society. Some of the problems resulting from undue stress are headaches, heart attacks, hypertension, peptic ulcers, weakening of the immune system, anxiety, lack of job involvement, job dissatisfaction, and occupational burnout [13]. This relationship between stress and diseases has had a major impact on American business. It is estimated that it costs about $150 billion annually for health insurance and disability claims, lost productivity, and other expenses [12].

The term stress is difficult to define as no universal definition has been accepted among scientists and researchers [3]. In general, stress involves the interaction of environmental stimuli, the physiological and psychological reactions to those stimuli, and coping responses of the person. Stress can be broken down into two basic components: external and internal stressors. External stressors can be separated into physical factors, such as low lighting, poor ventilation, and taxing physical tasks; and psychological factors such as job or role demands. Internal stressors are primarily a person's attitudes and expectations through which stress is placed on the self [4].

Stress can originate from various spheres of a person's life, for example, home, community, job, and socio-economic conditions of the society at large. Stressors from home and community conditions are age old, but stressors from the workplace have increased dramatically due to the rapid technological and economic advancement. These are expressed in the form of many issues such as job satisfaction, job security, participation in decision making, role in organization, career development, male-female equality, etc. Due to changing state compensation laws businesses have become interested in their employees' health because they may be held liable for a worker's ill health resulting from occupational stress [7].

Another change in the business world is that in recent years women have become a significant part of the labor force with over half of them employed outside the home at any given time. Two-thirds of married women in the 25-44 year-old age group work outside the home. Even though it is illegal to discriminate against women in the workplace,

there are many obstacles to equality of the sexes. The most notable inequality is the earnings gap between males and females [1].

There is also an enormous growth in younger women entering jobs which were formerly dominated by males. As a result female managers are subjected to a greater number work-related pressures compared to their male counterparts [6]. In their study Davidson and Cooper found that women in junior and middle management experienced the highest overall occupational stress levels; followed by male supervisors; senior women managers; male junior managers; female supervisors, and male middle managers [6]. However, senior male managers reported the lowest occupational stress levels.

Other studies contradict these results. Tung found that female administrators experienced significantly less occupational stress than male administrators in an educational setting [15]. Senatra also reported no statistically significant differences between men and women in job-related stress in public accounting firms [11]. Since most of the past studies on occupational stress have used exclusively male samples, Beehr and Newman suggest that sex should be used as a moderator [3].

Among types of managers the group considered to be more vulnerable to occupational stress are mid-level management. Stress related illnesses are also more common in this group than among top-level executives [9]. People often make jokes about one, two, and three-ulcer jobs because it is assumed that when executives reach a top-level in their organization, they are more prone to illnesses than their subordinates. However, the Bell Telephone system studies contradicted those assumptions. Top-level executives as a group were found to be less susceptible to heart attacks than other persons in the company. The heart disease rate of both the workers and the supervisors more than doubled that of the executive group [2].

On the basis of this literature review, it seems that more research is warranted to investigate male and female differences with respect to occupational stress. Furthermore, it would be interesting to study the effects of managerial rank with sex differences, as stress levels are found to be different among different managerial rank. The purpose of this study then is to investigate the relationship of sex and managerial rank with occupational stress. The independent variables in this study are sex and managerial rank. Managerial rank will be varied at three levels, (1) first-line supervisors, (2) mid-level managers, and (3) top-level executives. Occupational stress will be measured by the 14 scales of Occupational Stress Inventory (OSI) resulting in the three factors or dependent variables.

Hypotheses

The three main hypotheses are presented below.

1. There will be a significant difference between groups of male and female managers in regard to their mean scores on all three occupational stress factors.

2. There will be significant differences among the three groups of managers (first-line supervisors, mid-level managers, and top-level executives) in regard to their mean scores on all three occupational stress factors.

3. There will be a significant difference between sex and managerial rank in regard to the mean scores on all three occupational stress factors.

Method

The relationship of sex and managerial rank with occupational stress was examined using a questionnaire administered to ninety-six male and female managers, employed by a large multinational corporation in a mid-western state. The goal was to obtain six groups consisting of 16 male first-line supervisors, 16 female first-line supervisors, 16 male mid-level mangers, 16 female mid-level managers, 16 male top-level executives, and 16 female top-level executives.

The personnel director of the corporation was contacted to obtain permission to conduct the study and obtain names of managers. Sixteen managers were randomly selected from each group specified by sex and managerial rank. Once all managers were selected each individual was contacted by phone to obtain their agreement to participate in the study. In addition, an informed consent form was used to obtain permission of all subjects for their volunteer participation in this study and to allow their results to be used in a group form. The subjects were assured of complete confidentiality in this informed consent form.

When fourteen managers refused to participate in the study for different reasons, an additional fourteen names were randomly selected from those persons' respective sex by rank category in order to meet our goal of obtaining sixteen managers for each group. Then the packet containing questionnaires were sent to the subjects along with a pre-addressed, pre-paid postage envelope. Approximately one week later, the entire sample was sent a follow up. This procedure produced a total of ninety-six usable questionnaires.

Measures

Occupational Stress.

Occupational stress was measured with Occupational Stress Inventory (OSI). This inventory includes 140 items, and is designed to measure different kinds of stresses people experience in their work. Responses are on 5-point scales anchored by most of the time and rarely or never. The OSI has been shown to have acceptable levels of reliability and validity across a variety of settings. Normative data for this 14-scale inventory are available for 909 adult subjects in 130 different occupations employed primarily in technical professions and managerial positions. Alpha coefficients for the scales range from .71 to .94. Since OSI was a published and validated inventory, a total of 100 copies were purchased from Psychological Assessment Resources in Florida. (A list of items in the inventory is presented in Appendix A.)

Analysis of Occupational Stress Inventory (OSI).

The OSI was developed for two primary reasons: 1) to develop generic measures of occupational stressors that would apply across different occupational levels and environ-

ments; and 2) to provide measures for an integrated theoretical model linking sources of stress in the work environment, the psychological strains experienced by individuals as a result of work stressors, and the copying resources available to combat the effects of stressors and alleviate strains [10].

For the purpose of this study, the occupational stress was measured by three major factors resulting in three dependent variables. Factor 1 was measured by a set of six scales which were collectively called the Occupational Roles Questionnaire (ORQ). The ORQ scales were: Role Overload (RO), Role Insufficiency (RI), Role Ambiguity (RA), Role Boundary (RB), Responsibility (R), and Physical Environment (PE).

The second factor in our study was the Personal Strain Questionnaire (PSQ) which was a measure of the domain of psychological strain and composed of four scales: Vocational Strain (VS), Psychological Strain (PSY), Interpersonal Strain (IS), and Physical Strain (PHS).

Coping resources was the third factor of the OSI. This factor was assessed by the four scales which made up the Personal Resources Questionnaire (PRQ). These four scales were: Recreation (RE), Self-Care (SC), Social Support (SS), and Rational/Cognitive Coping (RC).

Coefficients of internal consistency and median item correlations were also calculated by applying the Cronbach's alpha formula to provide further justification for utilizing Occupational Stress Inventory as a multidimensional construct. These were presented in Table 1 which indicated that a coefficient alpha for each index was above .70.

Table 1

Pearson Correlation Coefficient for Indices of Occupational Stress Inventory with Coefficient Alpha on Diagonal

Factor Matrix[a]	Factor[1]	Factor[2]	Factor[3]
Occupational Roles - Factor 1	(.79)		
Personal Strain - Factor 2	.44	(.80)	
Personal Resources - Factor 3	.38	.39	(.77)
Median Item Correlations			
Within	.44	.61	.31
Between	.20	.18	.19

[a] Coefficient alpha are indicated in the diagonal of the Factor Matrix.

The question of how large the coefficient alpha should be for an item to be reliable is not consistent among researchers; however, some consider alpha at .70 to be a good criterion for adequate scale reliability [5].

In addition, to the scales described above, basic demographic questionnaire including sex, managerial rank, age, and length of employment with the company were included in the packet

Results

Demographic characteristics of respondents are shown in Table 2. The average subject was 41 years old and had 10 years of administrative experience. The median hours worked per week per subject were 52. A majority (60%) of respondents were married with children, and the median percentage of total life stress attributed to work was 70%. Approximately 50% (or 48) of the respondents was female, and 50% (or 48) was male.

Table 2

Demographic Characteristics of Respondents

		Percent %	Comment
1.	Sex		
	Male	50	As planned
	Female	50	
2.	Age		
	20 - 29	22	Average age
	30 - 39	40	41 years old
	40 - 49	20	
	50 - 59	12	
	60 and over	06	
3.	Managerial Rank		
	First-line Supervisor	34	One individual occupied
	Mid-line Manager	33	two positions at the
	Top-level Executive	33	time of survey
4.	Service With The Company		Average Service
	1 - 5 years	30	10 years
	6 - 9 years	23	
	10 - 14 years	18	
	15 - 19 years	10	
	20 - 24 years	08	
	25 and over	11	
5.	Median Hours Worked Per Week		
	40 - 45	15	Median Hours Worked
	46 - 51	32	Per Week
	52 - 57	40	52
	58 and over	13	

Comparative Analysis of Stress Profiles

To investigate the relationship of sex and managerial rank with occupational stress factors, a 2 x 3 factorial design was used, (see Figure 1), A 2 x 3 factorial analysis of variance was also used to analyze the data, with an alpha level of .05 for all tests.

Figure 1
Research Design

	Sex: Male	Sex: Female	
First-Line Supervisor	2* M Score = (23.62) n = 16	5 M Score = (22.00) n = 16	Avg. mean score for first-line supervisors (22.81)
Mid-level Managers	4 M Score = (22.18) n = 16	1 M Score = (24.31) n = 16	Mid-level managers (23.24)
Top-level Executives	6 M Score = (21.06) n = 16	3 M Score = (23.00) n = 16	Top-level executives (22.03)
	Average mean score for Male-Managers (22.29)	Average mean score for Female-Managers (23.10)	

*Numbers in parenthesis indicate the levels of stress experienced by the groups of managers

Hypothesis one predicts that there will be a significant difference between groups of male managers and female managers in regard to their mean scores on the occupational stress inventory factors.

To determine the levels of stress experienced by male managers on all three dimensions or factors of Occupational Stress Inventory were compared against those of their female counterparts (Table 3).

Table 3

Means, Standard Deviations for the ORQ[a], PSQ[b], and PRQ[c] Scales for Managerial Rank and Sex

			ORQ		PSQ		PRQ		ORQ, PSQ & PRQ	
	Group	n	M	SD	M	SD	M	SD	M	SD
Male										
First Line Super.	1	16	9.20	4.75	7.15	2.94	7.37	2.24	23.62	9.57
Mid Level Mgr.	2	16	9.37	3.25	5.62	2.30	7.18	2.98	22.18	8.15
Top Level Exec.	3	16	6.87	2.72	4.75	2.05	10.43	3.90	21.06	8.05
Total Male	(1,2,3)	48	9.08	3.20	5.05	2.25	10.14	3.86	22.29	8.17
Female										
First Line Superv.	4	16	9.12	3.21	5.52	2.26	5.35	2.99	22.00	8.10
Mid Level Mgr.	5	16	11.62	4.84	7.37	2.99	5.31	2.20	24.31	10.15
Top Level Exec.	6	16	10.00	3.80	6.75	2.73	6.25	2.47	23.00	9.45
Total Female	(4,5,6)	48	10.25	3.90	6.54	2.59	6.31	2.49	23.10	9.50

[a] ORQ = Occupational Roles Questionnaire. The ORQ scales are: Role, Insufficiency, Ambiguity, Boundary, Responsibility and Physical Environment.

[b] PSQ = Personal Strain Questionnaire. The PSQ scales are: Vocational Strain, Psychological Strain, Interpersonal Strain and Physical Strain.

[c] PRQ = Personal Resources Questionnaire. The PRQ scales are: Recreation, Self Care, Social Support and Rational/Cognitive Coping.

Table 4 presents the results of one-way analyses of variance between the male and female subgroups on all three factors while controlling for effects such as managerial rank, number of years in present position, and age. Table 4 indicates that the levels of stress experienced by male mangers on all three factors were lower than that of their female counterparts. Mean differences for male and female managers on all three factors are found to be significant with more than 95 percent confidence. This confirmed hypothesis one which led to its acceptance.

Hypothesis two predicts that there will be significant differences among the three groups of managers (first-line supervisors, mid-level managers, and top-level executives) in regard to their mean scores on the occupational stress dimensions. Table 3 presents perceived Occupational Stress Inventory indices mean scores and standard deviations for male - first supervisors, male - mid-level managers, male - top-level executives, female - first-line supervisors, female - mid-level managers, and female - top-level executives. Variations can been seen for mean scores on all indices. The question is how significant statistically are these differences.

Table 4

ANOVA: Male Versus Female Subgroups on all Three Factors of Occupational Stress Inventory

Categories	Factor 1 Occupational Role (OR)	Factor 2 Personal Strain (PS)	Factor 3 Personal Resources (PR)
Total Male X	9.20	5.52	7.43
Total Female X	9.12(.015)	5.15(.52)	5.37(.77)
Managerial Rank First Line Supervisor			
Total Male X	9.37	5.62	7.18
Total Female X	11.62(.096)	7.37(.99)	5.31(.75)
Managerial Rank Mid-Level Manager			
Total Male X	6.87	4.75	10.43
Total Female X	10.00(.90)	6.75(.88)	6.25(NS)
Managerial Rank Top-Level Manager			
Total Male X	9.78	7.25	6.85
Total Female X	9.88(NS)	7.60(NS)	6.24(NS)
10 Years or Less Years of Service in Present Position			
Total Male X	10.25	7.21	7.10
Total Female X	10.34(NS)	7.40(NS)	7.05(NS)
11 Years or More of Service in Present Position			
Total Male X	6.88	6.25	8.20
Total Female X	7.12(NS)	6.41(NS)	8.14(NS)
Age (< 41 Years)			
Total Male X	6.99	5.61	6.40
Total Female X	6.75(NS)	5.20(NS)	6.20(NS)

Note: Figures in parentheses are significance levels at P< .05. NS = not significant at P< .05. Age and length of service using only average age and average years of service at this firm.

To answer this question, the Student's t - statistic was used to test for mean-score differences among the three groups of managers on the Occupational Stress Inventory dimensions. The t - values were significant at the P=.05 level for all indices. In addition, Table 3 indicates that the levels of stress experienced by mid-level managers on all three

factors were higher than that of first-line supervisors and top-level executives.

Hypothesis three predicts that there will be a significant difference between sex and managerial rank in regard to the mean scores on the occupational stress dimensions. Table 4 presents the results of one-way analyses of variance between the three groups of managers on all three factors while controlling for effects such as age and number of years in present position. The reason for controlling for such effects was to make sure that any difference in means between the three groups of managers could not be attributed to differences in age nor to number of years in present position. Table 4 indicates that females in mid-level managerial rank experienced the highest overall occupational stress levels; followed by male supervisors; top-level female executives; male middle managers; female supervisors; and top-level male executives who reported the lowest occupational stress levels. Mean differences for male and female managers on all three levels of management, (first-line supervisors, mid-level managers, and top-level executives), on all three occupational stress factors are found to be significant with more than 95 percent confidence. This confirmed hypotheses two and three which led to their acceptance.

Other findings emerged from this study which indicated that the most clear and significant differences between sex and managerial rank in regard to occupational stress factors were those for Factor 3. The Personal Resources Stress (Factor 3) experienced by female managers in all "managerial rank," "number of years in present position," and "age" categories was substantially lower than that of male managers. The Occupational-Role Stress (Factor 1), and Personal Strain Stress (Factor 2), experienced by female managers were significantly higher than that of their male counterparts in all categories with the exception of the "42 and above" age category. The pattern of scores suggests that female managers are likely experiencing both emotional and physical symptoms of distress, in association with doubts about work performance and impaired interpersonal relationships. This pattern of scores on the Personal Resources Stress scales portrays individuals (mainly females in mid-level managerial rank) who probably have little relief from psychological strain at work, home, or in the social environment.

Conclusions and Discussion

Several significant conclusions seemed to emerge as a result of this study. First, this research data indicated that the levels of stress experienced by male managers on all occupational stress dimensions (the Occupational-Role based stress, the Personal Strain based stress, and the Personal Resources based stress) was lower than that of their female counterparts.

Second, the research findings also suggested that the levels of stress experienced by junior and mid-level managers on all three occupational stress factors or dimensions were higher than that of first-line supervisors or top-level executives.

Third, the findings clearly revealed that females in junior and middle management positions experienced the highest overall occupational stress levels; followed by male supervisors; top-level female executives; male middle managers; female supervisors; and top-level male executives who reported the lowest occupational stress levels. Females in middle

management positions also did experience significant interference or conflict between work and home roles. Sixty percent of the female middle managers felt that they come home from work too tired to do things they would like to do, felt the demands of their business took away from their personal interests, and made it difficult to relax at home. Interestingly, marital status, age, number of years in present position, and hours worked were not significantly related to occupational stress levels between male and female managers.

The conclusions from this study may not be generalizable beyond the organization studied, but they are generally consistent with and tend to support much of the previous research in this area ([6], [14]). Considerably more research on the relationship of sex and managerial rank with occupational stress would be helpful for employer and employee alike. Broader measurements of both individual and organizational outcomes influenced by occupational stress dimensions should be conducted to develop action plans to minimize or eliminate the stresses and strains in the work environment. Certainly, both attitudinal and behavior measures of the consequences of occupational stress in the workplace should be investigated across various organizational contexts. Management consultants and top managers might also benefit from research producing more substantive information on: (1) causes of occupational stress in the work environment, (2) problems resulting from undue stress, (3) impact of undue stress on productivity and organizational performance, and (4) relationship between the use of social support and feelings of stress and strain.

Although there are obvious limitations to the perceptual and self-reported data collected in this study, as well as with correlational analysis of such data, this study represents an effort at investigating the relationship of sex and managerial rank with occupational stress. Many issues are raised from these findings. With more women entering the male dominated job of management, more female managers are subjected to a greater number of work related pressures. Females and their family members are required to alter their personal and family roles, expectations and behavior so that areas of role conflict can be accepted and more effectively handled [14]. The overall profile of women in junior and middle management positions in this study suggests that further assessments of stress and stress interventions are needed.

Practical Applications: A Caveat

Existing research and business practices regarding occupational stress suggest forms of intervention strategies to minimize or eliminate the stresses and strains in the work environment.

On the corporate level, corporations should begin to take more initiatives in providing employees with training programs designed to help them deal with related stress. Corporations might choose to provide, for example, wellness and relaxation programs within their facilities. Exercise releases the body's own natural opiates — called endorphins — that are mood enhancing. The good feeling that comes from a work-out or a brisk walk is not incidental. That period of exercise affects the body's chemistry by dissipating the stress and tension and activating the body's natural opiates.

Furthermore, it is incumbent on corporations to develop corporate policies which will

minimize stress and strain on women in managerial positions. These polices might include flexible working arrangements, reasonable maternity leave, adequate day-nursery facilities, and opportunities to work at home.

In addition, family members are needed to provide social and morale support for women in managerial positions in order to cope with occupational stress and strains in the work and home environment. Family members will be required to alter their personal and family roles, expectations, and behaviors, so that areas of conflict can be accepted and effectively managed.

Finally, each person must recognize that stress is ever a part of our lives. We can't avoid it. Dealing with it emotionally means accepting that we are not always in control of the work — we cannot make everything right. Dealing with stress behaviorally means managing time and priorities and paying attention to diet and exercise.

Appendix A

Scale Descriptions and Possible High Score Interpretation[1]

Scale Name	Interpretation
Role Overload (RO)	High scorers may describe their work load as increasing, unreasonable, and unsupported by needed resources. They may describe themselves as not feeling well trained or competent for the job at hand, needing more help, and working under tight deadlines.
Role Insufficiency (RI)	High scorers may report a poor fit between their skills and the job they are performing. They may also report that their career is not progressing and has little future. Needs for recognition and success may not be met. They may report boredom and/or underutilization.
Role Ambiguity (RA)	High scorers may report a poor sense of what they are expected to do, how they should be spending their time, and how they will be evaluated. They seem not to know where to begin on new projects and experience conflicting demands from supervisors. They may also report no clear sense of what they should do to "get ahead."
Role Boundary (RB)	High scorers may report feeling caught between conflicting supervisory demands and factions. They may report not feeling proud of what they do, or not having a stake in the enterprise. They may also report being unclear about authority lines and having more than one person telling them what to do.

[1]Osipow and Spokane [10]; reported with permission.

Responsibility (R)	High scorers may report high levels of responsibility for the activities and work performance of subordinates. They are worried that others will not perform well. They are sought out for leadership and frequently have to respond to other's problems. They may also have poor relationships with people at work or feel pressure from working with angry or difficult employees or the public.
Physical Environment (PE)	High scorers may report being exposed to high levels of noise, wetness, dust, heat, cold, light, poisonous substances, or unpleasant odors. They may also report having an erratic work schedule or feeling personally isolated.
Vocational Strain (VS)	High scorers may report poor attitudes toward their work, including dread, boredom, and lack of interest. They may report making errors in their work or having accidents. They may also report that the quality of their work is suffering. Concentration problems and absenteeism may be in evidence.
Psychological Strain (PSY)	High scorers may report feeling depressed, anxious, unhappy, and/or irritable. They may report complaining about little things, responding badly in routine situations, and having no sense of humor. They may report that things are not "going well."
Interpersonal Strain (IS)	High scorers may report frequent quarrels or excessive dependency on family members, spouses, and friends. They may report wanting to withdraw and have time alone or, conversely, not having time to spend with friends.
Physical Strain (PHS)	High scorers may report frequent worries about their health as well as a number of physical symptoms (colds, heart palpitations, aches and pains, stomach aches, and erratic eating habits). They may report unplanned weight changes, overuse of alcohol, and disturbances in sleeping patterns. They may also report feeling lethargy and apathy.
Recreation (RE)	High scorers may report taking advantage of the recreational/leisure time coming to them and engaging in a variety of activities which they find relaxing and satisfying. They may also report doing the things they most enjoy in their spare time.
Self-care (SC)	High scorers may report that they regularly exercise, sleep eight hours per day, are careful about their diet, practice relaxation techniques, and avoid harmful substances (e.g., alcohol, drugs, tobacco, coffee).

Social Supports (SS) — High scorers may report feeling that there is at least one person they can count on and who values and/or loves them. They may report having sympathetic people to talk to about work problems and report having help to do important things and/or things around the house. They may also report feeling close to another individual.

Rational/Cognitive (RC) — High scorers may report that they have a systematic approach to solving problems, think through the consequences of their choices, and are able to identify important elements of problems encountered. They may report being able to set and follow priorities, and have techniques to avoid being distracted. They may also report being able to reexamine and reorganize their work schedule. They put their jobs out of their minds when they go home and feel that there are other jobs besides their present one which they can do.

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