CHAPTER 2

AN OVERVIEW OF ORGANIZATIONAL STRESS AND HEALTH

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Americans in increasing numbers are claiming that stress in the workplace has caused them some form of disability. A recent study by the National Council on Compensation Insurance (NCCI, 1984) indicated that claims involving mental disorders caused by stress accounted for nearly 11% of all occupational claims between 1980 and 1982. Moreover, claims in which stress causes a physical disability are now recognized in all compensation jurisdictions except Ohio (NCCI, 1985). Despite this increased recognition by the legal, medical and insurance communities, stress for many (even those in the scientific community) is a complex and nebulous construct implying numerous events and processes.

Occupational stress as a field of inquiry examining job conditions and their health and performance consequences is a relatively new research domain crystallizing in the early 1970's. Its conceptual roots, however, can be traced to the early animal research of Hans Selye (1936) and Walter Cannon's (1929) work on the physiological concomitants of emotion. In the early 1930's Selye (1936) discovered that a wide variety of noxious stimuli (which he later referred to as stressors), such as exposure to temperature extremes, physical injury, and injection of toxic substances evoked an identical pattern of physiological changes in his laboratory animals. In each case, the cortex of the adrenal gland became enlarged, the thymus and other lymphatic structures became involuted and deep bleeding ulcers developed in the stomach and intestines. These effects were "non-specific" in that they occurred regardless of the nature of the insult and were superimposed upon any specific effects associated with the individual agents. Some years later, Selye (1946) described this somatic response as the General Adaptation Syndrome (GAS) and defined stress as the non-specific response of the body to any demand made upon it. His mention of "nervous stimuli" among the "stressor" agents capable of eliciting the GAS had an energizing effect on those working in the field of psychosomatic medicine.

Cannon (1914, 1929) had earlier laid the scientific groundwork for an understanding of how various emotional states affect physiological functions and disease states by describing the "fight or flight" response. This response, evoked by potentially dangerous situations, included elevated heart rate and blood pressure, a redistribution of blood flow to the brain and major muscle groups and away from distal body parts, and a decrease in vegetative functions. Perhaps equally important, Cannon (1932, 1935) pioneered the concept of physiological homeostasis and developed the use of an engineering concept of stress and strain in a physiological context. In particular, Cannon (1935) proposed the notion of critical stress levels which were capable of

producing strain in the homeostatic mechanisms. Although he used the term somewhat casually, it is clear that Cannon, like Selye, conceived of stress as involving physical as well as emotional stimuli (Mason, 1975).

More recently, Richard Lazarus and his colleagues added immensely to the study of stress by describing in specific terms how one's perceptions of objective events determine their health valence (see Lazarus and Folkman, 1984).

Cognitive appraisal is described by Lazarus as an intrapsychic process which translates objective events into stressful experiences. The importance of this formulation lies in its recognition that subjective factors can play a much larger role in the experience of stress than objective conditions. Indeed, any given objective event can at once be perceived positively by one person and negatively by another ("One person's meat is another person's poison").

The study of occupational stress (as opposed to other sources of stress) was given tremendous impetus in the early 1970s by the establishment of the National Institute for Occupational Safety and Health (NIOSH) by Public Law 96-596 (Occupational Safety and Health Act of 1970). The stated goal of this agency is to assure safe and healthful working conditions for America's working men and women. NIOSH is the principal Federal agency in the United States engaged in research aimed at the recognition and control of job related hazards. That behavioral and motivational factors had an important bearing on the attainment of this objective was clearly acknowledged in certain research provisions of the OSHAct (1970). For example, Sections 20(a)(1) and 20(a)(4) explicitly directed NIOSH to include psychological, behavioral, and motivational factors in researching problems of worker safety and health, and in developing remedial approaches for offsetting such problems. Job conditions were broadly interpreted to include those of a psychological nature, consisting of undue task demands, work conditions or work regimens which apart from, or combined with, exposures to physical and chemical hazards may degrade worker physical or mental health (Cohen and Margolis, 1973). Since its inception, NIOSH has not only sponsored but conducted a large number of research studies which have helped to shape the course of job stress research in the United States.

A MODEL OF JOB STRESS AND HEALTH

Over the past twelve years, a paradigm of stress was developed by research psychologists at NIOSH to guide efforts at examining the relationship between working conditions and health consequences (see Figure 1). This model builds upon frameworks proposed by Caplan, Cobb, French, Harrison and Pinneau (1975), Cooper and Marshall (1976), and House (1974). In it, job stress is viewed as a situation in which some working condition (called a stressor) or combination of

conditions interacts with the worker and results in an acute disruption of psychological or behavioral homeostasis. These acute reactions or disruptions, if prolonged, are thought to lead to a variety of illnesses. As shown in Figure 1, the most commonly researched of these job stress-related illnesses have been hypertension, coronary heart disease, alcoholism and mental illness.

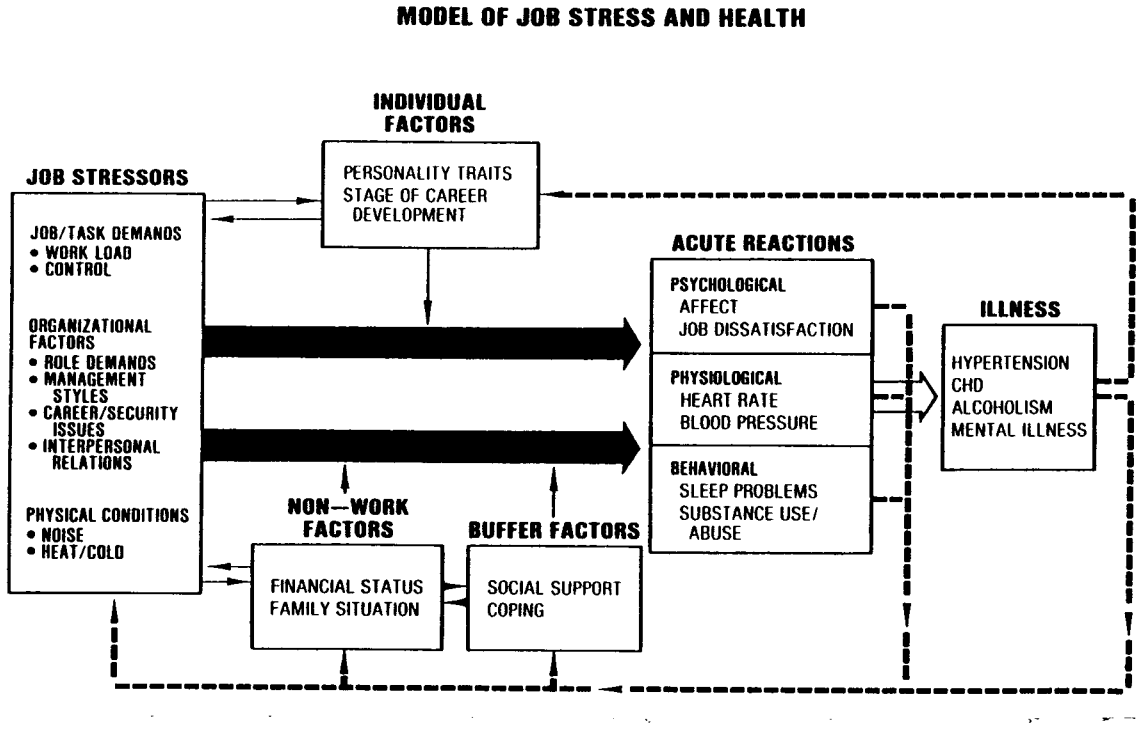

Figure 2.1. Model of Job Stress and Health

Job Stressors and Their Consequences

That various job conditions can produce psychological, physiological, and behavioral reactions in workers has been well documented (see Baker, 1985; Holt, 1982; and Hurrell and Colligan, 1982 for reviews). In general, these conditions or stressors fall into three very broad categories: Job/Task Demands, Organizational Factors, and Physical Conditions. Examples of common stressors in each category are discussed below.

Job/Task Demands. Workload is a feature of occupations that is easily recognized as "stressful" and has therefore received substantial empirical attention. Working excessive hours or holding down more than one job (or both), for example, has been associated with coronary

heart disease (CHD) morbidity and mortality (House 1974; Jenkins, 1971; Theorell and Rahe, 1972). Studies showing a correlation between workload and serum cholesterol levels (French and Caplan, 1972; Friedman, Rosenman and Carroll, 1958) also seem to suggest a CHD/workload relationship.

Recent evidence, however, has suggested that the amount of work does not seem to be as critical to health as the control the worker has over the work rate and related work processes. Karasek et al. (1979, 1982), for example, have used large scale data bases to examine the relationship between workload, work pace and degree of worker control. Their findings indicate that workers in jobs with higher workload and pacing demands, and lower control over these demands, have increased risk of coronary heart disease, higher blood pressure, and smoke more than employees in jobs without these characteristics.

Shift work is another job demand thought to have health and safety consequences. There is substantial converging evidence that night and rotating shift schedules, in particular, can lead to sleep disorders, gastrointestinal disorders, emotional disturbances, and increased risk of occupational injury (Rutenfranz, Colquhoun, Knauth and Ghata, 1977; Tasto, Colligan, Skjei and Polly, 1978; Smith, Colligan, Frockt and Tasto, 1979). The primary mechanism responsible for these effects appears to be disruption of biological rhythms resulting in physiological and biochemical disturbances. Shift work also has behavioral effects that can impact health, including altered sleeping patterns, increased alcohol and tobacco use, and altered eating habits (Rutenfranz, et al., 1977).

Organizational Factors. Numerous job stress studies have examined the psychological and physical effects of roles within work organizations. These studies were given original impetus by an investigation conducted in the early 1960s by Robert Kahn and his colleagues at the Institute for Social Research at the University of Michigan. In this nationwide survey, Kahn et al. (1964) found that men who experienced role ambiguity (i.e., lack of clarity about objectives associated with the work role, expectations concerning the work role and about the scope and responsibilities of the job) experienced low self-confidence, higher job related tension and lower job satisfaction. Likewise, workers who experienced role conflict (i.e., conflicting job demands) were found to experience more job related tension and to report less job satisfaction. A recent meta-analysis of 96 studies (Jackson and Schuler, 1985) has not only confirmed these relationships between role conflict, ambiguity and affective reactions, but has suggested that these role stressors are also related to absence and poor job performance. Role ambiguity and conflict have also been shown to be related to psychological responses such as increased heart rate and blood pressure (Caplan and Jones, 1975; French and Caplan, 1972; Ivancevich, Matteson and Preston, 1982).

Various management styles, such as the allowance of little or no participation in decision making, lack of effective consultation, restrictions on behavior, etc, are organizational features that also have been viewed as potentially stressful (see Beehr and Newman, 1978). Of these, lack of participation in decision making has received the most research attention. Early field studies demonstrated that greater participation in decision making led to greater job satisfaction, lower turnover, better supervisor-subordinate relationships, and increased productivity (Coch and French, 1948; French, Israel and Aas, 1960). Moreover, in a nationally representative sample of nearly 1,500 workers, nonparticipation at work was found to be significantly related not only to low self-esteem and low job satisfaction but to overall poor physical health, escapist drinking, depressed mood and absenteeism (Margolis, Kroes and Quinn, 1974).

Factors related to career development have also been linked to health consequences. These include overpromotion, underpromotion, status incongruence, lack of job security, fear of redundancy, obsolescence or early retirement (see Beehr and Newman, 1978). One of the most potent of these stressors appears to be ambiguity about one's job future. For instance, uncertainty about continued employment has been found to be related to low job satisfaction, low life satisfaction, low self esteem, escapist drinking and overall poor physical health (Margolis et al, 1974).

Relationships at work with one's colleagues, supervisors and subordinates have been identified as sources of job stress (see Davidson and Cooper, 1981; Beehr and Newman, 1978). For example, the most common sources of stress for a sample of 5,000 managers included inadequate support by supervisors, ineffective performance by supervisors, and conflict and ambiguity about what's expected (Pearse, 1977).

Physical Conditions. Adverse environmental conditions appear to be associated with health disorders in a synergistic way by exacerbating the overall job demands placed on employees, thus lowering worker tolerance to other stressors and decreasing worker motivation. Conditions like excessive noise, heat or cold, poor ventilation, inadequate lighting and ergonomic design deficiencies have been associated with employee physical and psychological health complaints and with attitudinal and behavioral problems (Caplan et al., 1975; Cooper and Marshall, 1976). It is also no coincidence that outbreaks of mass psychogenic illness typically occur in workplaces which employees view as physically uncomfortable (Colligan and Murphy, 1979).

Moderating Factors

As alluded to earlier, there are a number of personal and situational characteristics that seem to lead to differences in the way individuals exposed to the same work context perceive and/or react to the situation. These "moderators" are depicted in Figure 1 in the blocks labeled "Individual Factors," "Non-Work Factors," and "Buffer Factors," and are discussed separately below.

Individual Factors. The most widely discussed personal characteristic contributing to stress at work has been the coronary prone Type A behavior pattern characterized by intense striving for achievement, competitiveness, time urgency, excessive drive and over commitment to vocation or profession. In the past decade alone, many investigators have reported the Type A pattern to be independently associated with coronary artery disease. There is also extensive evidence that Type A persons show more severe and widespread coronary arteriosclerosis on coronary arteriography (Cooper et al., 1981). While static measurements have shown no differences in heart rate and blood pressure between Type A's and their opposite Type B personality type, Type A's upon exposure to various laboratory stressors, have been shown to exhibit more pronounced cardiovascular responses (Dembroski, MacDougall, Shields, Pettito, Lushine, 1978; Lovallo and Pishkin, 1980). Such findings have suggested to a number of authors (e.g., Ivancevich and Matterson, 1984) that an interaction between various job stressors and type A characteristics may produce reactions which ultimately lead to heart disease.

The hardy personality style is another individual characteristic thought to mediate the stressor illness relationship (Kobasa, Maddi and Courington, 1981). Hardy persons are believed to possess various beliefs and tendencies that are very useful in coping with stressors. These include tendencies toward optimistic appraisals of events and decisive actions in coping (Kobasa, Maddi, and Puccetti, 1982; Kobasa, Maddi Pucetta and Zola, 1985). Hardy persons have been found to report less illness in the face of stressors in both a retrospective and prospective study of executives (see Kobasa et al, 1985).

Stage of career development, while little studied, may also affect the stressor illness relationship. Extensive work experience, for example, may moderate worker response to negative events at work (Wanous, 1973). Indeed, several studies (e.g., O'Reilly and Roberts, 1975) have shown a positive correlation between age and work satisfaction. This has been interpreted to indicate that worker expectations of what is to be derived from work activity decrease with experience in the working world. Conversely, however, older workers may be more vulnerable to certain physical and mental job demands.

Non-Work Factors

Workers clearly do not leave their family and personal problems behind when they go to work nor do they typically forget job problems upon returning home. Nearly all models of job stress, in fact, acknowledge non-work factors and their potential interaction with work in affecting health outcomes. However, very few studies have attempted to examine the respective health effects of job and extra-organizational stressors (Bhagat, McQuaid, Lindholm, and Segovis, 1985). While some investigators have incorporated generic stressful life events scales into job stress surveys, these scales provide only rough indications of social, familial and financial stressors. It is quite clear that greater attention needs to be paid to these kind of factors. Interpersonal, marital, financial, and child-rearing stressors as well as other non-work situations can exacerbate existing job stressors to promote acute stress reactions. Alternatively, the absence of such extra-organizational problems may make a less than satisfactory job situation more tolerable (less stressful) and can impede the development of stress reactions.

Buffer Factors

A number of factors are known to weaken the stressor-acute reaction link and, therefore, reduce the occurrence of ill-health outcomes. Such factors are generally referred to as buffers. One of the earliest buffer variables examined in job stress research was social support. House and Wells (1978) showed that workers who report high levels of social support have fewer health complaints than comparably stressed workers with low social support. The source of support also appears to be important. Social support from one's supervisor or spouse was found by House and Wells (1978) to be more effective than support from co-workers or from friends or relatives. Support was also found to buffer the effects of stress on some health conditions (e.g., neurosis and ulcers) more than on others (e.g., angina). More recent research (Thoits, 1982) has confirmed the protective role of social support on worker health.

Another potent buffer is coping. A great deal of literature on stress coping exists but little of this knowledge has been included in occupational stress/health formulations until recently. Lazarus and colleagues (Cohen and Lazarus, 1979; Folkman and Lazarus, 1980) have indicated that coping is not a trait or disposition but is a continuous, transactional process which is modified by experience within and between stressful episodes. Further, a specific coping strategy which can serve to alleviate stress in one situation may be maladaptive in other situations (Cohen and Lazarus, 1979).

Pearlin and Schooler (1978) believe that the coping responses people use are a function of the social and psychological resources at their disposal. Social supports and psychological resources (e.g., mastery

and self-esteem) are what people draw upon in developing coping strategies. Research has shown that these resources vary by sex, educational level, and income such that men appear to have more psychological resources than women and use them to develop more effective coping responses. In the same way, the better educated and the more affluent possess more resources and a wider range of coping alternatives (Pearlin and Schooler, 1978).

What is more important, aside from what people actually do to cope with stress, is the relative effectiveness of coping responses. Pearlin and Schooler (1978) considered a coping response effective if it buffered the relationship between stressors and strains. The authors concluded that no single coping response was strikingly protective across life and work areas, but that having a larger and more varied coping repertoire was effective in reducing stressor/strain relationships. In this regard, the effectiveness of problem-focused vs. emotion-focused coping for buffering ill-health seemed to be a function of the controllability of the stressor, coping of any type being relatively ineffective in situations beyond the individual's control (Caplan, Naidu, and Tripathi, 1984; Felton, Revenson, and Hinrichsen, 1984; Fleishman, 1984; Krause and Stryker, 1984).

Particularly important in the present context was Pearlin and Schooler's finding that while various coping responses were effective in the areas of marriage, child-rearing, and household finances, coping was strikingly ineffective when applied to occupational problems. The authors suggested that the resistance of occupation to coping may be due to the impersonal nature of work and the lack of worker control over stressors.

Evidence from other recent studies suggests that some coping behaviors which workers use actually <u>increase</u> distress. Parasuraman and Cleek (1984) identified adaptive and maladaptive coping responses used in work settings. They found that adaptive coping responses (planning, organizing, and prioritizing assignments, enlisting the support of others) had no buffering effects on felt-stress or job satisfaction but were associated with <u>elevated</u> trait anxiety. Maladaptive coping (working harder, making unrealistic promises, avoiding supervision) contributed to felt stress and job organizational tenure, indicating that experience on the job did not necessarily lead to better stress coping skills (Dewe, Guest, and Williams, 1982).

It is clear from the foregoing that the coping responses which workers use may increase, decrease, or have no effect on stressor/health relationships. Those which increase or decrease stress reactions need to be factored into job stress assessment instruments to increase ecological validity and "fine tune" descriptions of stressor/health relationships. Coping behaviors which have no buffering effect provide insights into the types of stress reduction strategies which are likely to be successful.

JOB STRESS REDUCTION

Despite the complexities in job stress research, the merits of both individual-oriented, and to a lesser extent, work environment-oriented approaches to reduce stress have been explored. Given the conceptual framework emphasizing the subjective element of stress presented earlier, it is not surprising to find that most stress reduction studies in the literature have focused on the individual rather than the organization and have used individual-oriented outcome measures to assess program success. Such studies have clearly supported the efficacy of various types of stress management training in reducing psychophysiological and self-report signs of stress (Murphy, 1984). These techniques, applied in work settings, have a distinctive preventive flavor with an emphasis on imparting training skills to symptom-free workers. Accordingly, stress management is considered a health promotion activity rather than a strategy to relieve stress problems in troubled workers. Stress management has an important place in job stress reduction efforts because it addresses the issue of individual differences in the perception of events as stressful and can be useful in reducing reactions to work and nonwork stressors that interact with individual characteristics to produce health consequences.

While studies of individual-centered stress management approaches have steadily increased over the past 10 years, efforts to reduce or eliminate the sources of stress in work settings remain relatively sparse in the published literature. Reasons for this discrepancy seem straightforward: individual-oriented strategies are easy to implement, can be evaluated in the short term, do not require disruptions in production schedules or organizational structure, and fit nicely with managements' view of stress as an individual-worker problem (Neale et al 1982). Individual strategies also ride the coattails of the expanding interest among employers in health promotion/disease prevention programs which focus exclusively on individual lifestyle/behavioral change to improve health (DHHS, 1979, 1980; Parkinson, 1982).

At the same time, organizational change approaches require an accurate, valid assessment of work factors which generate undue stress, and an extensive knowledge of the dynamics of change processes in social organizations (e.g., Alderfer, 1976) so that potentially undesirable outcomes can be minimized. At the same time, organizational change strategies can be expensive and disruptive interventions, making them less palatable to management. Nevertheless, job redesign and organizational change approaches focus on reducing or eliminating the sources of stress at work and, hence, are preferred solutions.

Organizational strategies which have potential for preventing or reducing stress include quality circles, which bring bench-level workers into the decision-making process, worker representation on health and safety committees, more extensive training programs for workers whose jobs are being altered by the introduction of new technology, alteration of communication channels within an organization, and creation of more psychologically humane evaluation systems to replace ones that are either archaic or ones that monitor employee performance in a Big Brother fashion (e.g., computer monitoring of keystrokes). These interventions, however, have not been subjected to rigorous scientific evaluation, perhaps owing to some of the problems mentioned earlier. Evaluation schemes for such interventions should include an element of cost/benefit in addition to assessments of worker satisfaction, job stressors, performance, absenteeism, and health status.

The foregoing sections have described a growing knowledge base on occupational stress and health. Though the area is complex, and much additional research is needed, it is quite clear that organizations can no longer afford to ignore the human and organizational costs of stress. Instead, it has become increasingly mandatory for organizations to understand and endeavor to deal with it.

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CHAPTER 3

A REVIEW OF ORGANIZATIONAL STRESS ASSESSMENT INSTRUMENTS

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Legal researchers are concluding that managers can no longer choose to recognize and deal with the sources and symptoms of stress on the job -- it has become a legal obligation (Ivancevich, Matteson, and Richards, 1985). Organizational stress surveys can be used to provide management with information on both the levels and sources of employee stress. Stress surveys that can be employed in organizational settings are reviewed in this chapter.

THE COST OF OCCUPATIONAL STRESS

Stress is a costly business expense, affecting both employee health and company profits. However, companies can reduce stress and its effects through comprehensive work site stress management programs.

Consider these stress facts gleaned from various safety and insurance industry research (Jones, 1985):

- In 1982, the total cost of work-related accidents in the U.S. alone was $32 billion.
- The causes of about 75-85 percent of all industrial accidents are accident susceptibility factors (e.g., fatigue, poor concentration, inattentiveness).
- Psychological or psychosomatic problems contribute to over 60 percent of long-term employee disability cases.
- About 11 percent of all occupational disease claims are for workplace stress.

With regard to the last statistic, three forms of work stress claims have been delineated (National Council on Compensation Insurance, 1985). A physical-mental claim occurs when a physical injury results in a mental disability, such as a phobic fear of heights after falling from a scaffold and breaking a leg. Mental-physical claims happen if mental stress results in a physical injury, such as when constant deadline pressures, coupled with overwork, culminates in a heart attack. Lastly, mental-mental claims occur when mental stress causes mental disability. An example would be sexual harassment that leads an office worker to have anxiety attacks.

Legal suits for job-related stress likely will increase in the future because:

1. Research suggests a relationship between stress and injury/illness.
2. Many state workers' compensation laws specify compensation for injuries, both physical and mental, resulting from job stress.

3. More employees are prompted to file stress claims because they believe in the stress-loss connection and know that fellow employees have received workers' compensation for it.
4. Finally, lawyers, judges and physicians are becoming more familiar with this type of claim. It is more easily diagnosed and more often used to receive legal and monetary restitution.

Hence, it becomes imperative that companies begin to understand, assess, and remedy excessive levels of occupational stress.

But what is stress? By definition, stress is the adverse emotional and physical reactions employees have to any source of pressure in their environment. These stress reactions negatively affect personal health and organizational effectiveness and often create losses (see Table 3.1).

TABLE 3.1 THE PERSONAL AND ORGANIZATIONAL EFFECTS OF OCCUPATIONAL STRESSES

Personal

Alcohol abuse	Anxiety
Drug abuse	Psychosomatic diseases
Emotional instability	Eating disorders
Lack of self-control	Boredom
Fatigue	Mental illness
Marital problems	Suicide
Depression	Health breakdowns (cardiovascular, etc.)
Insomnia	Irresponsibility
Insecurity	Violence
Frustration	

Organizational

Accidents	Inflated health-care costs
Thefts	Unpreparedness
Reduced productivity	Lack of creativity
High turnover	Increased sick leave
Increased errors	Premature retirement
Absenteeism	Organizational breakdown
Disability payments	Disloyalty
Sabotage	Job dissatisfaction
Damage and waste	Poor decisions
Replacement costs	Antagonistic group action

Employees continually confront various pressures or "stressors." They experience stress if unable to effectively cope with such stressors as poor management, lack of job security, work overload, unclear communications, excessive deadline pressure, unrealistic expectations, insufficient pay, and uncertainty about job duties and responsibilities.

BREAKING THE DISTRESS CYCLE

The major goal of work site stress management programs is to help companies interrupt what is called the distress cycle. Diagram A illustrates how this damaging cycle evolves. Research by the St. Paul Insurance Company has shown that there are two basic approaches to breaking the distress cycle. One is to identify and to modify the stressors. The other is to increase an employee's ability to cope with stress. Both methods can be used individually or in combination.

For example, organizational stressors can be identified and corrected. Consider one production unit with a very high stress level, a high number of accidents, and low productivity. Results of an organizational stress survey showed that poorly defined job responsibilities caused stress in the unit members. After each person's job was analyzed and defined, production increased and accidents were reduced. The stress survey also revealed other stressors which needed controlling, including poor communications, undefined pay raise systems, and employee drug abuse (Jones, 1985).

The second way to break the distress cycle -- increasing the ability to cope -- consists of the more commonly known stress management techniques. These include physical fitness programs, relaxation techniques, assertiveness training, biofeedback, weight loss, drug and/or alcohol rehabilitation, and periodic physical examinations. These techniques are not intended to alter stressors, but to increase an individual's ability to cope with stressors in his/her environment.

THE ASSESSMENT OF ORGANIZATIONAL STRESS

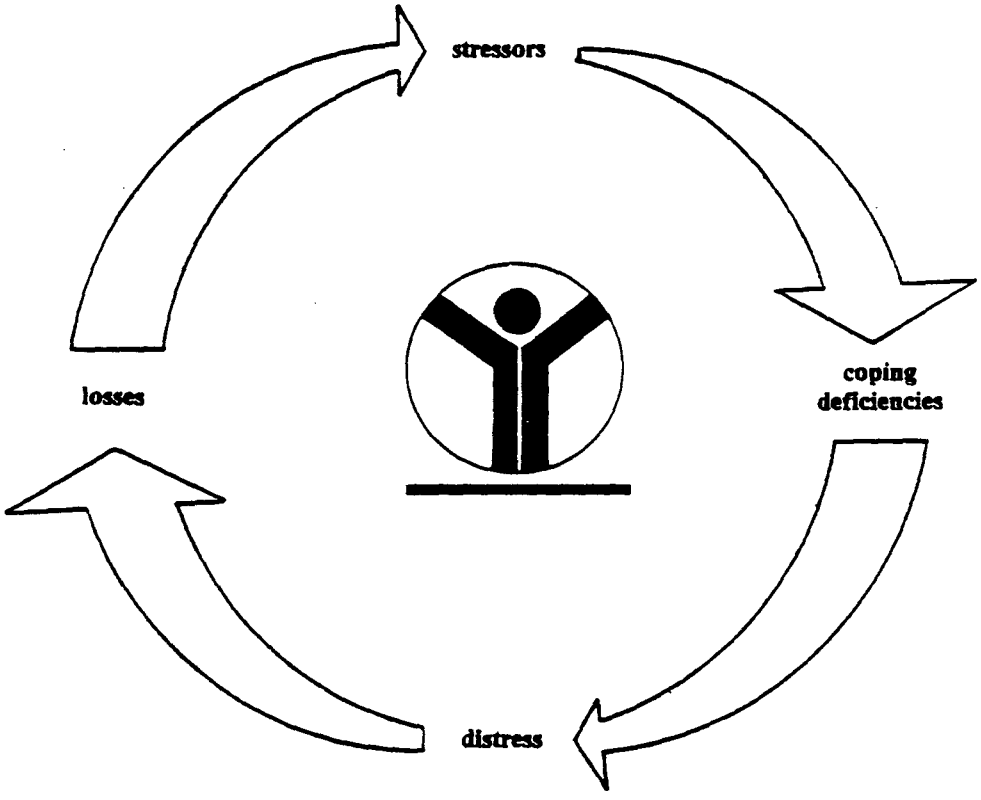
To better control stress-related losses in industry, companies must periodically use organizational stress surveys which assess: (1) Employees' physical, mental, and emotional reactions to a stressful work environment; (2) the corporate stressors which cause stressful, pressured work environments; and (3) the corporate, and employee, coping skills and resources that can serve as "stress buffers."

Research at The St. Paul Insurance Company (Burdick and Jones, 1985) indicates that companies are more likely to implement work site stress management programs once they learn, through an organizational stress assessment, that their employees are indeed experiencing exceptionally high levels of occupational stress. Ideally, the stress assessment

Diagram A.

The Distress Cycle

Employees are exposed to many stressors. Those who have coping deficiencies rather than coping skills become distressed. Chronic distress, in turn, leads to social and financial costs — accidents, injuries, turnover and poor productivity. But it doesn't stop there. These symptoms of distress become, themselves, stressors, and the distress cycle develops.



can pinpoint the overall level of company stress, levels of stress in selected work groups (e.g., departments, job types), and the major organizational stressors that are causing the employee stress.

The major purpose of this chapter is to review organizational stress assessment instruments that can be employed in business settings. The review is not intended to be comprehensive. Instead, this chapter focuses on a few key stress inventories that were specifically designed for work settings and that have ample evidence of validity. In addition, all of the instruments reviewed have been successfully tested in a wide variety of companies.

This review is geared toward practitioners who want to gain a better perspective on how to select, administer, score and interpret organizational stress surveys. Four different assessment tools are reviewed.

I. HUMAN FACTORS INVENTORY (HFI)

The Human Factors Inventory (HFI) is a 162-item organizational climate survey (Jones, 1983; Jones and DuBois, 1985). The HFI is used by businesses to assess various forms of occupational stress.

The HFI has the following six scales: Job Stress, Job Dissatisfaction, Organizational Stress, Stressful Life Events, Life and Health Risks, and Accident Risks. Test-retest reliability coefficients (one-week interval) for these six scales are .91, .90, .89, .89, .88, and .87, respectively. Each of these scales is briefly described below. In addition, two speciality scales -- the Technostress Scale and the Distortion Scale -- are also briefly described below. Norms exist based on over 100,000 employees representing hundreds of different companies and job types.

Job Stress. This scale identifies the average level of job stress that employees are experiencing at an individual level. General signs of job stress include feelings of frustration, boredom, irritability, nervousness and "burn-out" at work. Physical signs of job stress include headaches, stomach upset, backaches, chest pains, chronic fatigue, and sleep difficulties. Employees who score in the higher risk ranges are also less productive, they have higher rates of illness and absenteeism, and they often think about leaving the company. Finally, they feel that work-related pressure contributes to tension in their family. Sample items include: "I experience too much pressure on my job."; "I have lost efficiency on my job."; and "I feel burned out on my job."

Job Dissatisfaction. This scale assesses how dissatisfied employees are with various aspects of their job. Dissatisfaction with the following areas is assessed: Job, pay, promotional opportunities, co-worker relationships and overall management

effectiveness. Sample items include: "I am very satisfied with my job."; "This company is well managed."; "I am paid adequately for what I do."; and "We have a good team relationship in my department."

Organizational Stress. This scale assesses employees' perceptions of organizational stress. This scale identifies whether departments have unacceptable levels of organizational tension. Some general signs of organizational stress that are measured by this scale include poor productivity, interpersonal conflicts, departmental tension, excessive absenteeism, accidents and mistakes, and a perception that employees are distressed. Employee dishonesty, waste and on-the-job alcohol and drug misuse are also assessed. Sample items include: "My department is understaffed."; "There is more absenteeism and tardiness in my department than usual."; and "Staff turnover is high in my department."

Stressful Life Changes. This scale measures the amount of stressful life changes that employees have experienced in the past 12 months. Examples of stressful life changes that are assessed include taking on debts; an illness, injury, or death of a loved one; and major changes in job duties at work. This scale provides a measure of personal stress. Most companies request a stress survey that can differentiate between job stress and personal stress.

Life and Health Risks. This scale measures lifestyles and health habits that increase the risk for unnecessary injuries, illnesses, and premature deaths among employees. Examples of such risks include lack of exercise and relaxation, unsafe driving practices, poor nutrition and weight control, smoking, alcohol abuse, and so on. Sample items include: "I get a thorough physical examination each year."; "I try to prevent work stress by exercising and participating in recreational activities."; and "I get approximately eight hours sleep at least four nights a week."

Accident Risks. This scale measures four human factors that contribute to accidents and errors. The four factors are: (1) An inability to cope with stress; (2) Poor safety attitudes; (3) A tendency to worry about job performance, and (4) An inability to manage time. Sample items include: "Are you always safety conscious?"; "Do you feel hurried or rushed to complete deadlines at work?"; and "Do you feel fatigued during the workday."

Technostress. Countless employees have claimed that working with Video Display Terminals (VDTs) is an adverse experience. Many employees are wary of the potential health hazards of VDTs. This wariness leads to unnecessary stress. This scale measures how much "technostress" is experienced by employees who work with

VDTs. Some specific signs of technostress include headaches from VDT use, fear of radiation exposure, eye irritation and fatigue, muscle aches and pains, and emotional discomfort and stress. (Employees who do not use VDTs are excluded from any analysis with this scale.) Sample items include: "Do you get headaches from VDT use?"; "Do your eyes become irritated and fatigued from VDT use?"; and "Does working on a VDT cause you any emotional discomfort or stress?"

Distortion. This scale identifies the percentage of employees who are truthful with their responses. It identifies the number of employees who attempt to "fake good" or "fake bad" on the Human Factors Inventory.

Interpreting HFI Scale Scores

The HFI takes approximately 30 minutes to complete. It is given to all company employees. Participation is both anonymous and voluntary. The HFI survey results are then computer scored and compared to the national norm. An organizational "stress quotient" is computed for each company. This comparison allows companies to determine if their employees are above or below a national average in terms of their stress reactions and coping skills. The inventory also indicates in which jobs or departments employees are experiencing the most stress.

The major findings of the Human Factors Inventory are derived from analyzing the survey data on three levels: 1) Overall results for each scale for all company employees combined; 2) analyses by employee subgroups (e.g., job titles, departments, locations, demographic variables); and 3) response frequencies for individual items. HFI percentile scores ranging from 0 to 100 are plotted for each subscale. Higher scores mean greater risk. The following guidelines are used when interpreting all subscales:

Percentile Description Range

0 - 20%
Very Low Risk. The average employee is coping better than 80% or more of the employees represented in the norms. This is probably due to better coping skills and less exposure to stressful situations.

21 - 40%
Low Risk. The typical employee is coping better than 60 to 79% of the employees in the normative sample.

41 - 60%
Average Risk. The average employee is coping just as well as the average employee represented in the norms. The typical employee in this group is no worse or no better than the typical employee from the normative sample. That is, scores in this range mean that employees have both coping skills and coping deficiencies.

61 - 80%
High Risk. Scores in this range mean that there are opportunities to reduce stressors and improve coping skills. That is, the typical employee is coping worse than 61 to 80% of the normative sample employees. Interventions are needed for these employee groups.

81 - 100%
Very High Risk. Active interventions are definitely needed for these employee groups. The average employee is coping worse than 81 - 100% of the employees represented in the norms. This is probably due to poorer coping skills and more exposure to stressful situations.

In brief, work groups with percentile scores greater than 50 are experiencing above average levels of stress. Groups with percentile scores less than 50 are experiencing below average levels of stress. A score of 60 or more indicates critically higher levels of stress and should serve as a warning to companies that worksite stress management programs are definitely needed.

Validity

A test or survey is valid when it predicts those behaviors and outcomes that it was designed to predict. A number of validation studies have been conducted with the HFI (Jones and DuBois, 1985). A selection of five of these are presented briefly below.

In one study, 150 employed college students completed the HFI and made anonymous admissions of accidents, injuries and illnesses. Results showed that higher scores on the HFI (higher scores mean more stress and poorer coping skills) significantly correlated ($p<.05$) with higher rates of on-the-job accidents, minor injuries, major injuries, minor illnesses, major illnesses, and days of work missed due to injury and/or illness. Higher HFI scores were also associated with more frequent use of medical facilities. Finally, higher HFI scores were associated with poorer productivity and tendencies to look for a new job. This study was replicated with over 6,000 employees who represented hundreds of different job titles.

Forty-two employees who reported on-the-job injuries to an occupational nurse participated in another validity study. All employees worked for the same company. Reported injuries typically

fell into one of four categories: Falls and trips, lifting strains, lacerations, and miscellaneous (e.g., smashed finger, infection of unknown origin, hematoma from dropping cabinet on foot, etc.). All injuries required medical care and time off from work. All of these occupationally-injured employees completed the HFI to further test the hypothesis that employees who get injured at work experience more job stress and dissatisfaction than their co-workers.

Obtained results supported the hypothesis. Statistical analyses showed that the injured employees, on the average, experienced higher levels of job stress, job dissatisfaction, and organizational stress compared to a control group of over 1,000 co-workers ($p<.01$). In addition, the injured employees encountered more stressful life changes during the past 12 months compared to the control group ($p<.01$). These findings support the hypothesis that employee stress is related to more on-the-job accidents and injuries.

A second part of this study examined the stress levels of a group of workers who engage in a high level of wellness behaviors. From the theory of stress, it is expected that employees who engage in the regular use of stress management techniques and maintain healthy lifestyles (i.e., regular exercise, good nutrition, strong social support network, etc.) will be more resistant or hardy when exposed to normal or high levels of stressors.

To assess the sensitivity of the HFI to measure groups with high levels of wellness behaviors and expected low levels of distress, 80 practitioners of the Transcendental Meditation Program were surveyed with the HFI and compared both with the norm group and with the injured employees. As expected, the meditating group displayed significantly lower levels of job and organizational stress than either the norm group or the injured workers ($p<.01$).

Also, their scores on the Accident Risks, Job Dissatisfaction, and Life and Health Risks scales were significantly lower than the other groups ($p<.01$ in all cases). The scores on the Stressful Life Changes scale showed no significant differences, indicating that the level of life stressors were similar. The lower levels of stress reactivities measured by the Job and Organizational Stress scales can be presumed to be due to the increased level of stress coping skills rather than a lower level of stressors.

The relationship between HFI scores and levels of chronic back pain was assessed with 518 hospital employees in another validity study. Employees indicated how often they experience distressing backaches and pains. Back pain and injury is a leading cause of workers' compensation claims. Obtained results show that approximately 21% of all employees experience high rates of backaches and pains. Only 13% of employees reported that they "never" experienced back pain (see Table 3.2).

Table 3.2. Relationship Between HFI Scores and Chronic Back Pain.

Pain Frequency	Sample Size	Percent of Total
Never	69	13.3%
Rarely	181	34.9%
Sometimes	161	31.1%
Often	83	16.0%
Always	24	4.6%
TOTAL	518	100.0%

The relationship of HFI job stress scores to frequency of back pain is presented in Table 3.2. A very strong relationship between stress and backpain is documented. That is, employees who report higher levels of job stress also report significantly more back pain. In fact, the employees (N = 24) who report that they "always" experience back pain also suffer from critically high levels of job stress (i.e., Job Stress = 90th percentile).

Finally, the HFI was administered in 17 hospitals. Stress scores were compared to a number of hospital loss indices. Statistically significant results ($p<.05$ in all cases) showed that hospital departments that had higher stress levels had higher rates of turnover, employee injuries, worker's compensation claims, and risk for medical malpractice compared to the hospital departments with lower stress. In addition, a very strong relationship was obtained between HFI stress scores and frequency of back pain, thus replicating Study Four.

The results of these validity studies indicate that companies that use the HFI to assess corporate stress can be assured that higher HFI scores indicate a higher risk for loss due to accidents, injuries, illnesses, medical claims, poor productivity, turnover, and acts of negligence. Stress management training, at both the level of the individual employee and the organization, should lead to lower rates of stress-related accidents and losses.

Case Study

This case study describes how the HFI was used to control losses in the hospital industry. Approximately 1,500 employees from a southeastern hospital anonymously completed the HFI on company time. These employees represented over 40 hospital departments. Analyses revealed that three clinical medicine departments (e.g., surgical nursing, anesthesia, and pharmacy) exhibited critically high levels of stress on the HFI Job Stress, Job Dissatisfaction, and Organizational Stress scales. Analysis of these departments' insurance loss statistics revealed that a number of malpractice claims ranging from

$50,000 to over $100,000 had recently been filed. Item analyses of the HFI stress scales helped to identify a number of organizational stressors (e.g., poor communications, ineffective management, understaffing) that the hospital administration was willing to correct now that a connection between high departmental stress and risk for medical malpractice was established. Moreover, the hospital administrators admitted that they were "suspicious" about these high risk departments, yet they did not know where to begin to remedy the situation. Administration was now receptive to a number of different work site stress management programs.

Another finding showed that employees in the general services department at the hospital (i.e., housekeeping, laundry, maintenance) had extremely high personal stress scores, as measured by the HFI Stressful Life Changes scale. This same department also had nearly $100,000 in workers' compensation losses for the year preceding the stress assessment. This finding prompted the hospital to implement an Employee Assistance Program (EAP) that provides opportunities for professional counseling to chronically distressed employees and their families. This case study documents how the HFI can be used in a hospital setting to control losses. A summary of some of the other ways in which the HFI has been used in industry is provided below:

1. Focus Efforts. Employee groups at greatest risk of having stress-related accidents, injuries, or illnesses are identified. Some possible solutions to their situation are provided. Companies can then direct their training and development dollars to where the need is greatest.

2. Pinpoint Strengths and Weaknesses. Companies get a clear picture of how well the employees and managers are coping with stress compared to a national norm group. Companies can determine whether certain jobs or departments experience more or less stress than others. They can see if important human factors, such as job stress and employee wellness, cause their employees to be more susceptible to accidents, illness, poor productivity, and premature death.

3. Create Awareness. Just by administering the HFI, employees feel management is interested in improving the quality of their work life. In turn, employees become more motivated to manage stress and seek wellness in their lives.

4. Employee Involvement. The HFI opens up an invaluable communication channel between all levels of employees and management. Such employee involvement leads to improved morale, especially when employees see that their input helped to facilitate the implementation of work site stress management training programs.

5. Evaluate Progress. Results presented in one year's HFI profile can be compared with the results of future employee profiles to develop a clear measurement of progress. Study after study indicates that a reduction in employee and corporate stress, followed by an increase in both job satisfaction and employee wellness, should lead to a decrease in the following areas: Medical claims and accidents, illness, turnover and absenteeism, theft, sabotage, and poor productivity. Such decreases should be reflected in improved employee morale, better organizational efficiency, and higher corporate gains.

6. Prevention. Finally, the HFI can be used to identify potential stress-related loss areas before they cause any significant level of loss.

II. WORK ENVIRONMENT SCALE (WES)

Dr. Rudolf Moos developed the Work Environment Scale in order to assess the quality of worklife and stress levels in many types of work units. The WES is described in depth elsewhere (e.g., Moos, 1981). Some key features of this organizational climate survey are described below.

The standard WES consists of 90 items that make up 10 subscales. Normative data have been collected for over 1,400 employees from general work groups and over 1,600 employees from a variety of health care work groups. Test-retest reliability coefficients (one month interval) are all in an acceptable range, varying from a low of .69 to a high of .83, depending on the subscale.

WES Subscales

The 10 WES subscales assess 3 underlying dimensions of organizational functioning: The Relationships dimension, the Personal Growth dimension, and the System Maintenance and System Change dimensions. The subscales that comprise each dimension are described in Table 3.3.

Inspection of Table 3.3 reveals that the WES subscales can be used to assess organizational stress levels and major organizational stressors. For example, the Work Pressure subscale assesses the experience of workplace stress and tension. Examples of items on this subscale include: "There is constant pressure to keep working."; "People cannot afford to relax."; "It is very hard to keep up with your work load."; "There always seems to be an urgency about everything." The Involvement subscale is also an excellent measure of

TABLE 3.3.--WES Subscales and Dimensions Descriptions

RELATIONSHIP DIMENSIONS

1. Involvement - the extent to which employees are concerned about and committed to their jobs

2. Peer Cohesion - the extent to which employees are friendly and supportive of one another

3. Supervisor Support - the extent to which management is supportive of employees and encourages employees to be supportive of one another

PERSONAL GROWTH DIMENSIONS

4. Autonomy - the extent to which employees are encouraged to be self-sufficient and to make their own decisions.

5. Task Orientation - the degree of emphasis on good planning, efficiency, and getting the job done.

6. Work Pressure - the degree to which the press of work and time urgency dominate the job milieu

SYSTEM MAINTENANCE AND SYSTEM CHANGE DIMENSIONS

7. Clarity - the extent to which employees know what to expect in their daily routine and how explicitly rules and policies are communicated

8. Control - the extent to which management uses rules and pressures to keep employees under control

9. Innovation - the degree of emphasis on variety, change, and new approaches

10. Physical Comfort - the extent to which the physical surroundings contribute to a pleasant work environment.

employee stress. This subscale determines if employees are concerned about and committed to their jobs (low stress) or if workers are apathetic about and uncommitted to their jobs (high stress). Examples of items on this subscale include: "There's not much group spirit; A lot of people seem to be just putting in time; It's hard to get people to do any extra work; Few people ever volunteer."

The WES also can be used to assess organizational stressors and stress buffers. For example, management can be considered a stress buffer if favorable scores are obtained on the Supervisor Support subscale, and as a stressor if unfavorable scores are obtained on this subscale. Similar interpretations can be made with the Peer Cohesion, Task Orientation, Clarity, Control, and Physical Comfort subscales.

Validity

Moos (1981) reviews a number of validity studies conducted on the WES. Holahan and Moos (1981 a, b) found that a number of WES subscales were related to complaints of depression and psychosomatic symptoms in a representative sample of men and women workers. Brady, Kinnaird, and Friedrich (1980) found a relationship between perceived work environment, as measured by the WES, and job satisfaction among staff members of a mental health center. More specifically, employees who saw their work settings as more oriented toward involvement, cohesion, support, autonomy, and innovation showed greater satisfaction with their jobs.

Wetzel (1976, 1978) found that WES scores were associated with clinical measures of depression. Moos (1981) reviewed a number of studies (e.g., Bromet and Moos, 1977) that related WES scores to recovery rates among working alcoholics. Relapsed alcoholics had lower scores (i.e., more stress) on both the Work Pressure and the Physical Comfort subscales than the recovered patients.

Case Study

There are a number of practical applications for the WES as described by Moos (1981). A major use is to compare various subgroups of employees in order to assess their stress levels and determine some of the possible sources of their stress.

In this case study, the WES profile of 35 staff members in a residential care setting for older people (Work Group A) was compared to the profile of 42 staff members in a community mental health center (Work Group B). Work Group A was known to be relatively satisfied with their jobs, as evidenced by turnover rates that were much lower than that of other long-term care settings. Work Group B was known to have a morale problem.

Analysis of WES profiles revealed that Work Group A differed from Work Group B on a number of different dimensions. Work Group A, the low stress staff, felt committed to their jobs, were friendly and supportive of one another, and thought that the facility management was supportive and helpful. Group A staff felt that there was a strong emphasis on good planning and efficiency and little work pressure. The Group A staff reported that they knew what to expect in their daily routine and that rules and policies were clearly communicated. Finally, this staff perceived a better than average degree of autonomy and self-sufficiency in their jobs, and they reported that their facility was above average in physical attractiveness and convenience.

Conversely, the staff members in Work Group B perceived a significantly different work environment as revealed by the WES. They reported low involvement, poor communications, and a lack of peer cohesion and supervisor support. This staff perceived an emphasis on autonomy and self-sufficiency, yet Work Pressure scores revealed excessive pressure to keep up with an ever-increasing workload. Furthermore, the staff perceived their workplace as being poorly organized and inefficient, and they were unclear about expectations, rules, and procedures. Comparing and contrasting the WES profiles in this case study indicates that improving the work environment of Work Group B may be an effective first step toward improving employee morale.

III. MASLACH BURNOUT INVENTORY (MBI)

The Maslach Burnout Inventory (MBI) measures staff "burnout," a syndrome of emotional exhaustion and cynicism that occurs frequently among chronically distressed "people workers" (Maslach, 1982). Hence, the MBI is appropriate for use with police officers, counselors, teachers, nurses, social workers, psychiatrists, psychologists, attorneys, physicians, and agency administrators. The MBI is thoroughly described elsewhere (e.g., Maslach and Jackson, 1981).

The MBI consists of three regular subscales and a fourth optional subscale. The four subscales are:

1. The 9-item Emotional Exhaustion subscale (e.g., "I feel emotionally drained from my work.");
2. The 5-item Depersonalization subscale (e.g., "I feel I treat some recipients as if they were impersonal 'objects'.");
3. The 8-item Personal Accomplishment subscale (e.g., "I feel I'm positively influencing other people's lives through my work.");
4. The 3-item, optional, Personal Involvement subscale (e.g., I feel I'm personally involved with my recipients' problems.")

These four subscales are scored separately. They have been proven highly reliable and have been validated against numerous criteria

under a variety of validation strategies (Maslach and Jackson, 1981). For instance, Barad (1979) found that larger caseloads were significantly correlated with more intense feeling of burnout among Social Security employees.

Case Studies

The MBI was administered to 130 police families in order to better understand the impact of job stress on family life (Maslach and Jackson, 1979). Both police officers and their spouses completed the MBI. Analyses showed that high burnout scores were associated with more domestic strain. The ability to link job stress to marital problems provided the justification to implement a variety of work site stress management programs.

The MBI was also given to 83 child care workers in order to understand some of the sources of job stress (Maslach and Pines, 1977). Results showed that higher burnout scores were related to higher staff-child ratios and longer hours of direct contact with children. Conversely, lower burnout scores were associated with the use of relaxation breaks, regular staff meetings, and good team relationships. Hence, the MBI was used to identify major stressors and stress "buffers," respectively. Corrective steps were then taken to eliminate the organizational stressors.

IV. ORGANIZATIONAL MANAGEMENT SURVEY (OMS)

The Organizational Management Survey (OMS) is a 43-item instrument designed to identify a variety of organizational stressors in the workplace (Jones, 1984). The OMS is used by companies to identify the most prevalent organizational stressors that exist in a work group. Management can use the OMS in order to reduce or eliminate stressful job elements. Unlike the three previous stress surveys, the OMS yields item scores, not scale scores.

The OMS is typically not given to all employees within a work organization. Organizational stress surveys like the HFI, WES, and MBI are given first. These comprehensive measures of occupational stress can then be used to identify highly stressed work groups within companies. The OMS can then be used to identify the exact type of organizational stressors that are operative within the distressed work groups. An example of this strategy is presented in the following case study.

Case Study

The HFI was administered within a large hospital to over 800 employees representing approximately 30 departments. The HFI scores identified the Surgical Nursing Department as being one of the most stressed clinical medicine departments in the hospital. The OMS was given to

this nursing group in order to get a finer understanding of the organizational stressors that were impacting this group.

Eighteen nurses completed the OMS. The following stressors were identified: (1) Nurses were overworked and responsible for too many tasks; (2) poor communication existed between this work group and the other work units in the hospital; (3) nurses were chronically worried about job security; (4) unsafe equipment was being used; and (5) management talked down to employees, failed to give sufficient feedback, and did not compliment employees who did their jobs well. The data from the OMS supported the initial results from the HFI. It was also discovered that this high risk nursing department was engaging in a number of acts of negligence within the hospital that could eventually lead to a medical malpractice loss. Hospital administration studied the OMS results and quickly set out to correct the organizational stressors that were identified.

V. INDIRECT MEASURES

Some companies might not have access to organizational stress surveys for a number of reasons, one being financial. For these companies, there are a number of indirect measures of stress that can be used to identify high risk work groups.

Insurance claims data are often related to organizational stress (Jones and DuBois, 1985). Companies can analyze workers' compensation costs, medical costs, and the frequency and severity of accidents in order to determine if there are more losses than usual or more losses compared to similar types of companies. Other indirect measures include turnover and productivity data. Ideally, this data can be analyzed across time and by different work groups in order to identify an aberrant pattern of losses that can be linked back to job stress. Corrective actions could then be taken.

CONCLUSION

This chapter described a number of instruments that can be used to assess organizational stress. These instruments are cost-efficient, brief, and can be used in nearly any type of work setting. They can be administered and scored by nonprofessional personnel, who, with a bit of training, can also deliver basic interpretive information to key decision makers within a company.

Other stress inventories like the Stress Map (Jaffe and Scott, 1985), the Stress Audit (Miller and Smith, 1983) and the Stress Management Questionnaire (Peterson and Lawrence, 1983) exist, but too little validity data has accumulated to warrant detailed descriptions in this chapter. By the same token, inventories like the Job Descriptive Index (Smith, Kendall, and Hulin, 1969) have a proven track record,

yet their focus is on employee satisfaction, not organizational stress. Still other instruments, like the ones developed by the Institute for Social Research at the University of Michigan (Caplan, Cobb, French, Van Harrison, and Pinneau, 1975) and used in many studies of occupational stress, do not lend themselves to use by those unfamiliar with psychometric theory.

The purpose of this chapter was to describe a few key stress inventories that are valid and have a history of successful business applications. Readers must be warned that accurately assessing employees' stress reactions and organizational stressors is the first step in controlling stress-related losses. The critical step is the implementation of a comprehensive work site stress management program to control or actually prevent stress-related losses. Such a program should teach management how to correct organizational stressors, and employees how to improve their stress coping skills.

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