

11

Stress and the Workplace: 10 Years of Science, 1997–2007

*Alankrita Pandey, James Campbell Quick, Ana Maria Rossi,
Debra L. Nelson, and Wayne Martin*

This chapter broadly addresses stress in the workplace, with emphasis on environmental and social factors in stress. Within this context, we focus on new science within the period of 1997–2007. However, it would be unreasonable to ignore established and valid research that predates 1997 for that reason alone. Therefore, we treat science and scientific practice that predates 1997 as a baseline that moves into the 10-year period of our focus. Thus, the chapter includes as a foundation work before 1997 and builds on top of that foundation from leading research in the 10 years of emphasis. The chapter is organized into five major sections that correspond to constructs in our work stress process model, which provides a context and guide for interventions (see Figure 11.1). The first three sections of the chapter track the stress process in the workplace, from the causes of stress, through the latest science on the psychophysiology of stress, to the outcomes of stress in the workplace. The last two sections of the chapter focus on preventive management actions for stress in the workplace. The first of these sections is titled “stress prevention” and the second is titled “managing stress.” The past 10 years have brought a host of new developments in workplace stress research and scientific practice and also have confirmed many aspects of earlier knowledge in the field.

CAUSES OF STRESS

As we move through our review, as guided by the model, some definitions are in order (adapted from Quick, Quick, Nelson, & Hurrell, 1997). The term “stress” represents the over-arching umbrella; that is, it forms the domain in which we study an individual’s experience of demands and consequences at work. Stressors (demands) are the physical or psychological stimuli that serve to trigger the stress response within the individual. As such, they are the causes of stress faced by workers. The outcomes, or consequences, that follow from the stress response, can be positive (eustress) or negative (distress or strain). In this first section of the chapter, we explore the causes of

stress (stressors or demands) that appear frequently in studies of work stress over the past 10 years as articulated in Figure 11.2.

Before turning to specific stressors, it is important to recognize the dominant theoretical frameworks and their effect on the way we view work-related causes of stress. The theory of preventive stress management (Quick & Quick, 1984) construed articulated stressors as demands that were grouped into four categories: physical demands (from the physical work environment), role demands (stemming from expectations, both inside and outside the workplace), task demands (arising from the type of work performed), and interpersonal demands (associated with relationships at work). From this framework, a host of studies emerged that focused on specific demands in each category. Prevalent in the early research was a focus on role conflict and ambiguity, work/home issues, and research on job types (Quick, Quick, Nelson, & Hurrell, 1997).

The job demands/job control model posits that it is the level of demands in a job, in concert with the level of control, that lead to job strain. Specifically, jobs with high demands and low control (i.e., “high-strain” jobs) lead to distress (Karasek & Theorell, 1990). Considerable support exists for this model. Most recently, a longitudinal study of 812 employees in Finland indicated an association between high-strain jobs and the risk of cardiovascular mortality (Kivimäki et al., 2002). The early distinguishing factor in this model was the interaction of the demand level with the amount of control. Recent studies, however, have indicated that low job control in and

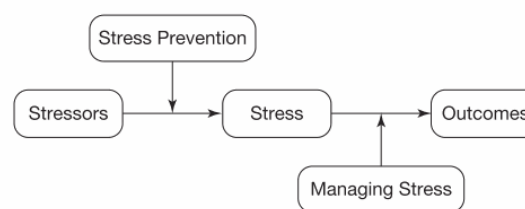


Figure 11.1 ■ The work stress process with interventions.

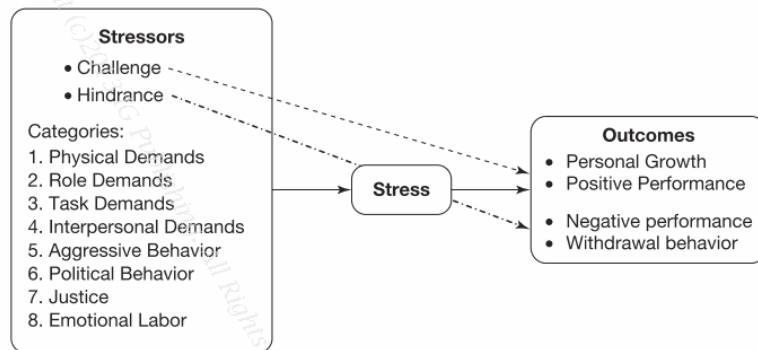


Figure 11.2 ■ Stressors and outcomes.

of itself is a critical risk factor for distress (Hemingway & Marmot, 1999).

The effort-reward imbalance model proposed by Siegrist (1996) posits that it is the mismatch of high effort expended at work with attendant low rewards that leads to distress and negative health outcomes. In this model, rewards include not only compensation, but also job security and broader career opportunities. Support for the model has been found across various occupations (van Vegchel, de Jonge, Bosma, & Schaufeli, 2005).

A two-dimensional stressor framework also emerged that considered stressors to be either challenges or hindrances. Challenge stressors are associated with personal growth and achievement, whereas hindrance stressors thwart task accomplishment and personal growth (Cavanaugh, Boswell, Roehlin, & Boudreau, 2000). Challenge stressors are positively associated with job performance, whereas hindrances are negatively related to performance (LePine, Podsakoff, & LePine, 2005). In addition, challenge stressors have been positively associated with job satisfaction and organizational commitment; hindrance stressors are negatively associated with satisfaction and commitment, but positively associated with withdrawal behavior and work strain (Podsakoff, LePine, & LePine, 2007).

In summary, the dominant theoretical frameworks have complementary views of stressors. Evidence indicates that low control, high overall demands, an imbalance of efforts and rewards, and stressors that are viewed as hindrances, all have detrimental consequences in the workplace for individuals and organizations. We now turn to a more specific look at the stressors that have dominated researchers' attention in the past decade.

STRESSORS AS CONTEMPORARY CONCERNS

In addition to growing bodies of research conducted within the broad stress frameworks, there are many studies that examine discrete stressors. Before 1997, we saw job type, gender, and work-home issues emerge as

dominant themes. These stressors continue to garner research attention, but, in addition, our review indicates four other stressors that are joining their ranks: aggression at work (consisting of bullying, violence, and sexual harassment), politics in the workplace, justice issues, and emotion work/emotional labor.

BULLYING/VIOLENCE/SEXUAL HARASSMENT

Of considerable concern, especially in terms of national surveillance systems, is increased aggression in the workplace and its attendant distress and strain. In a 20-country study of psychosocial risk factors, workplace bullying, violence, and harassment emerged as some of the top risks in the workplace, and researchers called for the implementation of an international surveillance system to monitor these risks, among others (Dollard, Skinner, Tuckey, & Bailey, 2007). A large-scale study of 890 human service workers echoed these findings. Exposure to violence and threats emerged as one of the stressors for human service professionals. Exposure to violence at work was a strong predictor of absenteeism (Rugulies, et al., 2007).

Bullying involves negative, aggressive behavior that is a threat to a target's self-esteem or professional competence. With bullying, the victim is unable to defend himself/herself against the aggression. Typically, bullying persists over a considerable period of time. At work, bullied employees report significant psychological strain, especially mental fatigue (Agervolds & Mikkelsen, 2004). Bystanders of bullying also report distress, and there is evidence that certain contextual influences may make bullying a more frequent stressor. Bullying is likely to occur in stressful work situations in which there is substantial interpersonal conflict along with destructive leadership styles. Bullying is more prevalent in work situations in which immediate supervisors avoid dealing with stressful situations (Hauge, Skogstad, & Einarsen, 2007).

Sexual harassment produces a host of negative outcomes for both individuals and organizations, and distress is one such outcome (Shaffer, Joplin, Bell, Lau, &

Oguz, 2000). Even relatively low intensity but frequent episodes of sexual harassment have significant negative effects for working women in terms of psychological and job-related outcomes (Schneider, Swan, & Fitzgerald, 1997). And sexual harassment need not be face-to-face. Female employees in call centers frequently experience sexual harassment over the telephone, which leads to higher strain and lower job satisfaction and job performance (Sczesny & Stahlberg, 2000). The prevalence of sexual harassment in the workplace, despite guidelines on sexual harassment published in 1980 by the Equal Employment Opportunity Commission, has led to calls for treating sexual harassment as a chronic workplace problem. Researchers argued that it should be treated in a manner similar to other chronic health problems in the workplace, complete with an identification of its precursors and the development of strategies for its prevention (Bell, Cycyota, & Quick, 2002).

POLITICS/POLITICAL BEHAVIOR

Another stressor receiving increased research attention is that of organizational politics. What is interesting about this particular stressor is that, depending on how it is defined, its effect is not necessarily negative. When politics is defined as actions by individuals in their own self-interests without regard to the well-being of others, there is evidence of a positive relationship with job strain (Harris & Kacmar, 2005). In addition, job strain is a possible mediator of a positive relationship between politics and subsequent aggressive behavior in organizations (Vigoda, 2002).

However, when political behavior is defined simply as the use of influence, a different pattern of relationships emerges. For individuals with a negative reputation, political behavior has been related to increased emotional exhaustion and lower job performance ratings, but for those with a positive reputation, it was associated with decreased emotional exhaustion (Hochwarter, Ferris, Zinko, Arnell, & James, 2007). There is also evidence that political skill, which is the ability to influence others and act in ways that enhance personal and/or organizational goals, can have a neutralizing effect on distress. Greater political skill was found to reduce the negative effects of role conflict on several strain indicators, including anxiety, somatic symptoms, and physiological distress (Perrewe, Zellers, Ferris, Rossi, Kacmar, & Ralston, 2004).

JUSTICE AND FAIRNESS IN THE WORKPLACE

Perceptions of unfairness in the workplace constitute another source of stress that is the focus of research attention. Three specific forms of justice have been investigated, including procedural justice (fairness of organizational processes), distributive justice (fairness of outcomes received by individuals), and interactional justice (fairness of interactions with others in the organizations,

most often supervisors). In general, favorable evaluations of organizational justice have been related to lower job strain (Elovainio, Helkama, & Kivimäki, 2001).

Recent studies have focused on justice climate and on ways to increase justice at work. Group-level perceptions of justice climate (distributive and procedural justice), as well as individual-level perceptions, were significantly related to lower levels of anxiety and depression (Spell & Arnold, 2007). Among nurses who experienced a pay cut, insomnia was reduced when the nurses' supervisors had been trained in interactional justice (Greenburg, 2006). This study showed that interactionally fair treatment by supervisors exerted a buffering effect on strain resulting from being underpaid.

EMOTION WORK

There is a growing body of stress research focusing on emotion work and/or emotional labor. Employees, particularly those in customer service, are expected to manage their emotions in accordance with display rules. Pressures to act in ways that are often inconsistent with the experience of one's emotions are characteristic of emotional labor. When the experience of conflict between emotions and behavior becomes chronic, there are negative effects on psychological and physical health (Schaubroeck & Jones, 2000).

Two forms of acting have been identified that help employees behave in accordance with the organization's display rules. Surface acting is modifying one's facial expressions, whereas deep acting is modifying one's inner feelings. Research has indicated that surface acting is related to greater job stress (Grandey, 2003). High emotional demands and emotional labor have been identified as key psychosocial risk factors in the workplace and as such they are important targets for organizational risk management.

THE STRESS RESPONSE: RECENT DEVELOPMENTS IN PSYCHOPHYSIOLOGY AND WORK STRESS

In the past decade, the field of psychophysiology has made some clear moves from the laboratory into the workplace, intervening to prevent and manage stress. And, because of modern capacities to monitor biological signals, psychophysiological interventions can be crafted that elegantly address problems in situ.

In the following text, we highlight three diverse examples that illustrate that psychophysiological interventions can be employed in the workplace to reduce the effects of stress: the prevention of musculoskeletal repetitive strain injuries (RSIs) with surface electromyography (SEMG) biofeedback, promising developments in the use of physiological monitoring of sleepiness for professional

drivers to prevent accidents, and interventions to reduce the sequelae of workplace stress using heart rate variability feedback.

RSIs are the bane of a workforce that increasingly interacts with technology, and can create both pain and functional limitations that impair work. RSIs may stem from both physical and psychosocial stressors (Peper et al., 2003), as well as from the effect of stress-related hyperventilation on muscle behavior of the shoulders and neck (Schleifer et al., 2002). Peper et al. (2003) devised an innovative strategy to address RSI using SEMG biofeedback and respiration training at workstations. Subjects' muscle tension levels and respiration rates were monitored at baseline and then while using a keyboard and mouse. The subjects were provided information about their muscle tension while performing the task. Finally, they were trained using active SEMG feedback to engage only the muscle tension necessary to the task, to incorporate "microbreaks" into their workflow, and to employ diaphragmatic breathing as they performed computer-based work. This intervention resulted in subjective reports of diminished arousal and tiredness, as well as lower, more functional levels of muscle tension while working.

Driver fatigue and sleepiness constitute grave dangers to the driver and to others. If interventions can be found that sense sleepiness, then accidents due to drowsiness may be averted and lives saved. Papadelis et al. (2007) physiologically monitored fatigued drivers operating vehicles (a professional driver was in the front passenger seat and had full controls to operate the car if needed). The results pinpointed precursors to dangerous levels of sleepiness observed in both the electroencephalogram and the electrooculargram signals. This type of monitoring may eventually be designed into vehicles, so that drivers can receive real-time feedback on their degree of alertness.

Heart rate variability biofeedback (Gevirtz & Lehrer, 2003) can be used to reduce stress and its effects on both mind and body. Barrios-Choplin, McCraty, & Cryer.

(1997) provided a stress management training program to workers that involved heart rate variability monitoring and feedback. Results included improvements in several job performance variables, as well as a reduction in blood pressure readings for hypertensives. McCraty et al. (2003) examined a stress reduction program with similar use of heart rate variability feedback, and found a decrease in stress indicators, notably including significant reductions in blood pressure. Finally, B. Hinojosa (personal communication, 27 March, 2008) gave teachers a brief training experience in heart rate variability feedback. Teachers then engaged in home practice using a paced breathing relaxation recording designed to optimize breathing and heart rhythm. The teachers reported significant improvements in their capacity to manage stress, as well as in their ability to share their newfound skills with their families and students.

These examples of innovative use of SEMG biofeedback, neurophysiological monitoring, and heart rate variability feedback show the bright potential of psychophysiology to enhance the management of stress.

OUTCOMES OF THE STRESS PROCESS

We now focus on the outcomes of the stress process as noted in Figure 11.2 and expanded in Figure 11.3. Time magazine in 1983 called stress the "Epidemic of the Eighties" (Time Magazine, June 6, 1983), but now, two decades later, we know that stress is here to stay, not just a fad or passing health concern. Adult Americans report high levels of stress and distress. Even as far back as 1996, *Prevention* magazine found that about 75% feel that they experience stress one day a week and one out of three experience it more than two times a week. This is an increase over the 55% reported in 1983. Stress manifests in various severe psychological and physiological forms of distress when it is not well managed and channeled. The 1996 studies showed that 75–90% of visits to the physician are stress-related. The severity of these adverse

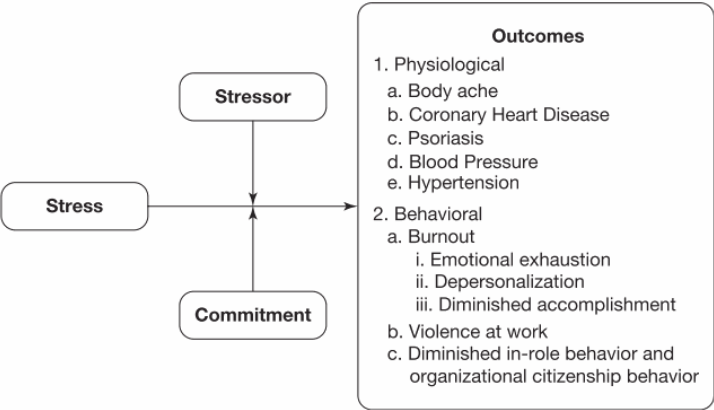


Figure 11.3 ■ Outcomes of the stress process.

outcomes of the stress process has led the American Institute of Stress to identify stress "America's number one health problem" and to place job stress very high on the list of major national concerns.

PHYSIOLOGICAL REACTIONS AS OUTCOMES

Reactions to stress are immediate and involuntary. As discussed extensively elsewhere in this volume, the stress response includes useful reactions to immediate physical threats that effectively promoted survival in early humans. These are initiated by activity of the sympathetic adrenomedullary system and the hypothalamic pituitary adrenocortical axis. Among the specific reactions that are part of the physiological stress response are elevations in heart rate and blood pressure, and increased flow of blood to large skeletal muscles and to the brain, adjustments that support adaptive physical (e.g., "fight or flight") and mental activities (e.g., decision-making). There are also elevations in blood sugar levels, produced by the breakdown of glycogen, fat, and protein stores, which adds to the amount of fuel that is available for effortful mental and physical responses. Other changes provoked by stress include faster clotting, which minimizes blood loss from lacerations, and alterations in blood flow that shunt blood away from organs that are not essential to successful defense against immediate physical threats (e.g., digestive and reproductive systems). As adaptive as these responses may be when elicited by acute, physical emergencies, they do little to facilitate survival when provoked by many contemporary stressors, which often involve psychological threats and require cognitive and behavioral solutions that do not entail vigorous, "fight or flight" action. The repeated activation of biological stress mechanisms by psychological challenges and threats is thought to exert an insidious, pervasive, and persistent effect on the body, resulting in "Diseases of Civilization"—hypertension, strokes, heart attacks, diabetes, neck aches, low-back pains, and several skin problems (American Institute of Stress Website).

TYPES OF OUTCOMES

Cordes and Dougherty (1993) suggested four major groups of stress consequences: physical and emotional, interpersonal, attitudinal, and behavioral, which, in turn, may be classified into two broader groups of constructs: (1) physiological and (2) behavioral (Selye, 1983). We first discuss behavioral outcomes and then physiological ones.

Behavioral Outcomes of Stress

Among the behavioral effects of stress, one of the more severe outcomes is burnout. Maslach (1982) argues that burnout has three components: emotional exhaustion, depersonalization (felt distance from others), and diminished

personal accomplishment. According to a review by Lee and Ashforth (1996), the outcomes of emotional exhaustion and depersonalization are strongly linked to increased turnover intentions and lowered organizational commitment, and only weakly associated with control coping. Maudgalya, Wallace, Daraiseh and Salem (2006) reviewed prior literature on burnout among IT professionals finding that exposure variables such as role ambiguity, role conflict, and job tasks led to higher job burnout. They concluded that managers of IT employees must be aware of these exposure variables and take steps to protect employees for company and employee well-being.

Other behavioral outcomes include acting nervously and impulsively, and showing lower tolerance toward others, in some cases leading to increased aggression (Vigoda, 2002). One of the more severe outcomes of stress in the workplace is violence that erupts when men and women feel pushed to the breaking point and no longer able to tolerate stress. Acting out with violence is one way to draw attention to their plight. Violence in the workplace takes different forms at different levels. At the lowest level it involves swearing and mild sexual aggression, escalating to threats to the organization or to coworkers, and on to suicide attempts, physical altercations, and damage to life and property (Johnson & Indivik, 1994). Stressful work environments also lead to bullying as a study in Norway recently demonstrated (Huage, Skogstad, & Einarsen, 2007). Bullying also increases in the absence of proper supervisor intervention.

Stress has also been found to have a negative effect on in-role behavior, organizational citizenship behavior (OCB), and customer satisfaction (Tarris, 2006). Many organizations and their members benefit from OCBs, which take the form of discretionary activity that improves the social and psychological context in which the technical core of the organization operates (Allen & Rush, 1998; Van Scotter, Motowidlo, & Cross, 2000). Stress can significantly reduce OCBs, leading to decreased long-term benefits for employees (Chang, Johnson, & Yang, 2007).

The effects of stress on performance differ depending upon the level of affective organizational commitment, or the worker's emotional attachment to the organization. Commitment can moderate the relationship between felt stress and job performance, so that stress is positively associated with performance when commitment is relatively high, and negatively associated with performance when commitment is relatively low (Hunter & Thatcher, 2007).

Physiological Outcomes

That the effect of work stress on heart health is negative is well known. Indeed, the news seems to become more depressing as more studies are carried out. A cohort study of 812 people who were free from cardiovascular disease showed that after an average period of 25.6 years of high job strain, high demands, and high work pace, there was a 2.2 increased risk of cardiovascular

mortality, while people with an effort–reward imbalance (low salary, lack of social approval, few career opportunities) had a 2.4 increased risk (Kivimäki et al., 2002). Also, job strain, in the form of high psychological demands combined with low decision latitude, increases the risk of a first coronary heart disease event (Aboa-Eboulé et al., 2007). Vital exhaustion, inability to relax, and sleep disturbances also appear to reflect demands such as overtime work, shift work, hectic work, and job strain, leading to elevations in risk factors for cardiovascular diseases. In particular, elevated blood pressure is seen as one of the underlying mechanisms through which work-related stress leads to cardiovascular diseases. Overtime work appears to operate as a stressor because it increases the demands on an employee attempting to maintain performance levels in the face of increasing fatigue (Rau, 2006).

Initial attacks and subsequent manifestations of severe skin afflictions, such as psoriasis, often appear to be due to stress. Ingram (1954) considered emotional stress to be the most potent precipitating factor in psoriasis. In a large postal survey of psoriasis patients conducted in the United States, the incidence of stress was found to be 40% (Seville, 1977). Other studies by Seville (1978, 1989) yielded similar findings. In yet another study, more than 60% of a sample of psoriasis patients believed that stress was a principal factor in the cause of their psoriasis (Griffiths & Richards, 2001).

The physical effect of stress exposures can accumulate over time. Stress is often quite literally a “pain in the neck” and/or in the lower back and shoulders, as a study on 413 New Zealand dentists found (Palliser, Firth, Feyer, & Paulin, 2005). The annual prevalence of pain both in the lower back or neck was 63%, with 49% experiencing pain in the shoulders as well. Dentists scoring high on work-related stressors were more likely to have greater musculoskeletal discomfort.

Allostatic load (AL) is an index that enables the cumulative effect on the body of chronic stress to be assessed, and is derived from a set of relevant biological measures. Sun, Wang, Zhang, and Li (2007) conducted a 13-parameter AL study of 1,219 employees in China to assess the relationship between AL and strain. They found that participants with high job strain exhibited significantly higher AL than did those with lower job strain. In addition, their multiple regression results supported the relationship of decision latitude and job demands with AL, with AL positive related to job demands and negatively to decision latitude. This study suggested that work-related psychological stress may affect multiple-system physiological function and may reflect more than one risk factor.

Antecedent-Dependent Outcomes

The different outcomes of stress vary, depending on how it is caused. For instance self-employed people are more likely to have significantly higher levels of work stress in some studies, although details on the derivation of

the stress measure were not provided (Lewin-Epstein & Yuchtman-Yaar, 1991; Parslow et al., 2004). Jamal (1997) also found that the self-employed reported more job stress. But there were no differences in mental health between these self-employed and other people. Self-employed subjects had significantly more psychosomatic health problems, which are physical disorders in which both emotions and thought patterns are believed to play a central role, and usually develop when a person's disease-fighting ability is weakened due to stress (University of Michigan Health System website). Sexual harassment is also a cause of stress that leads to specific outcomes such as depression and posttraumatic stress disorder. One study found unwanted sexual attention or sexual coercion to be stressors that women said constituted harassment, despite the retrospective nature of the event(s), which were an average of 11 years in the past (Schneider, Swan, & Fitzgerald, 1997; Dansky & Kilpatrick, 1997).

STRESS PREVENTION: PRIMARY PREVENTIVE STRESS MANAGEMENT

The first three sections of the chapter examined new research related to the stress process in organizations and the workplace. New causes, new applications of psychophysiology, and new stress outcomes are refining our knowledge of this important issue. What about the interventions that organizational leaders and health professionals have available for preventing and/or managing stress? What continues to work well and what does new research say? We begin by examining the theory of preventive stress management and the actions available within its framework. Gavin, Nelson, Quick, and Quick (2008) concluded that public health prevention, specifically primary, secondary, and tertiary prevention, has proved itself to be effective over the past 25 years. One major case study and intervention program within a large industrial organization over a 6-year period (Klunder, 2008) saved lives, prevented workplace violence, and averted \$33 million in costs related to workplace grievances that did not materialize. Effectiveness was additionally and more broadly demonstrated in workplace intervention programs implemented in a wide range of occupations (Levi, 2000).

Because the preferred point of intervention in public health and preventive medicine is always primary prevention (Levi, 2000), we focus first on primary preventive stress management as presented in Figure 11.4. We explore the established practices of situational and environmental change as well as cognitive/psychological intervention. Although there is very limited new science on primary prevention during the past decade, we do examine important advances in cultural differences and selection, optimization, and compensation (SOC) behaviors that help inoculate the individual against distress.

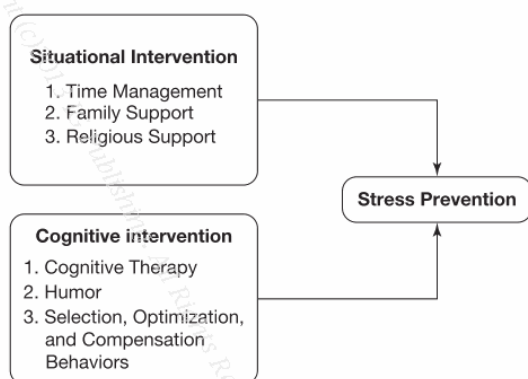


Figure 11.4 ■ Stress prevention.

We then examine secondary prevention interventions designed to manage stress. We take tertiary prevention, commonly known as therapy or therapeutic intervention, as beyond the scope of this chapter.

SITUATIONAL INTERVENTION: CHANGING THE ENVIRONMENT

Each individual has a different way of dealing with stress according to his/her personal experience and learning history. Situational approaches to managing stress are used by individuals and families because control over environmental influences can reduce the stress level of many of the people involved. The situational approach to stress management in the workplace includes the development of time management techniques, training in family relationship skills, and religious affiliation.

TIME MANAGEMENT

Time management strategies can be highly beneficial, maximizing personal energy and reducing stress. Each individual has a different level of personal energy in each phase of his/her life. This personal energy can be used to facilitate the individual's daily activities or to reduce emotional stresses caused by environmental influences. Performance peaks and the generally most productive times must be identified to maximize the use of the personal energy. It is important to specify realistic and measurable goals, avoid perfectionism, and allow flexibility for unexpected events. The individual's ability to manage his/her time in an effective way has positive effects on work-related stress (Macan, 1994). Time management can, in itself, reduce stress levels to the extent that it enables individuals to feel more confident and in control of their responsibilities.

FAMILY SUPPORT

The family can be either a stressor or a coping resource (Bhagat, 1983). Saleh et al. (2007) found that the families of orthopedic surgeons were a significant and positive source of support for those in the profession holding leadership positions, primarily in academic settings. However, family conflict also has been associated with psychological distress and physical complaints (Frone, Russell, & Barnes, 1996). Through interaction within the family, individuals acquire problem-solving techniques that can either reduce or increase their stress level. Three important ways for families to deal with stress are: reframing, mobilization, and passive assessment. Reframing is when the family redefines the stressful event in such a way as to make it more manageable. Mobilization refers to the search for and/or acceptance of help from others to solve a problem. Passive assessment is the ability of the family to accept problematic or conflicting issues, minimize negativity, accept differences, and understand and share problems with one another, as well as to give and receive support for all family members. Communication between family members is extremely important for increasing empathy and encouraging all family members to express themselves (Shaffer, 1983).

RELIGIOUS SUPPORT

The solidarity networks organized by churches, temples, and other religious centers are a source of support that can relieve professional and family stress. The environment of any given place of worship brings together a group of individuals who share beliefs and values. Their frequently similar point of view helps these individuals to relate better among themselves and to develop more empathy for one another. The sense of fellowship that results from religious involvement can reduce stress, create inner peace (Levin, 1984), and enhance positive emotional expression at work (Ashkanasy, Hartel, & Zerbe, 2000).

COGNITIVE INTERVENTION: CHANGING THE WAY WE THINK

This approach focuses on identifying and restructuring negative thinking. It is based on the idea that attitudes and thoughts underlie an individual's mood instead of or in addition to external events. Cognitive approaches include the use of professional counseling and the use of humor at work.

PROFESSIONAL COUNSELING AND COGNITIVE THERAPY

Cognitive therapy is based in part on the principle that thoughts affect people emotionally and physiologically,

and can trigger anxiety and depressive disorders. The therapy focuses on teaching individuals to recognize and reframe negative, dysfunctional thinking. It is used in conjunction with behavioral techniques. Many studies have indicated the positive effect of cognitive therapy in improving mood and regulating stress (Ellis & Harper, 1975; Seligman, 1991).

HUMOR AT WORK

Vaillant (1977) identified humor as one of the mature adaptive mechanisms in his 35-year update of the Grant Study results of adult life adjustment. He identified humor as the ability to express one's thoughts and feelings without discomfort to oneself or others. In a major literature review of humor and work, Duncan, Smeltzer, and Leap (1990) surveyed theories and research and then described a specific application illustrating the importance of humor at work. Laughing as one expression of humor has been shown to have a positive effect on the body and on health (Robinson, 1991). Laughing stimulates the brain to block the production of immunity suppressors such as cortisol, and may accelerate the production of beta-endorphin.

NEW PREVENTIVE INTERVENTIONS: ATTENDING TO CULTURE AND CHANGING BEHAVIORS

Situational and cognitive interventions have been well established and continue to appear effective in the appropriate context. What is new in workplace stress prevention is attention to cultural differences and cultural context as well as the introduction of new behaviors aimed at restructuring the work and the family environment. Attention is always focused on the setting in which the stress process occurs, with the aims of managing the sources of stress and/or demands.

CULTURE AND STRESS

In the past decade the increasingly international presence of stress research has brought considerable attention to the effect of culture. A particularly interesting study by Schaubroeck, Lam, and Jia (2000) demonstrated the effects of culture in a U.S.–Hong Kong comparative study. These researchers examined collective efficacy and self-efficacy in the job stress process for bank tellers. Within the U.S. culture, job self-efficacy was an instrumental moderator in the linkages of job demands with psychological health symptoms and turnover intentions, such that for those tellers high in job self-efficacy, high levels of job control reduced job stress. However, for U.S. tellers low in job self-efficacy, high job control exacerbated, and low job control reduced, levels of job stress. By contrast,

collective efficacy, in contrast to job self-efficacy, showed the same interaction pattern for the Hong Kong tellers. Thus, high control was helpful for those with high collective efficacy in high-demand jobs, whereas low job control was helpful for those with low collective efficacy in high-demand jobs. Cultural differences may play an important role in the stress process and must be factored into preventive stress management strategies.

SELECTION, OPTIMIZATION, AND COMPENSATION BEHAVIORS

With regard to job and family demands, inter-role conflicts, in which role pressures from work and family are found to be mutually incompatible, often arise (Greenhaus & Beutell, 1985). This conflict takes two directions. Work-to-family conflict occurs when experiences at work interfere with family life. Family-to-work conflict occurs when experiences in the family interfere with work life. These can be prevented using SOC behaviors, which are defined based on the operation and coordination of three components: selection of goals or behavior components; optimization of the means to reach these goals; and compensation, or the use of substitutive means to maintain functioning when previous means are lost or blocked (Freund & Baltes, 1998). The SOC model spells out four self-management strategies for pursuing and maintaining personally relevant goals: (a) elective selection (developing and committing to a hierarchy of personal goals), (b) optimization (engaging in goal-directed actions and means), (c) loss-based selection (changes in the goal or the goal system in response to loss), and (d) compensation (acquisition and use of means in response to loss). What are the effects of behavioral strategies aimed at reducing the amount of demands or stressors experienced both on the job and at home? Baltes and Heydens-Gahir (2003) found that the use of SOC behaviors in the work and family domains was positively related to lower amounts of job and family demands or stressors. These lower amounts of stress in both domains led to lower levels of work-in-family (WIF) conflict and family-in-work (FIW) conflict, and this held when controlling for hours worked, gender, job involvement, family involvement, social support, and supervisor support.

MANAGING STRESS: SECONDARY PREVENTIVE STRESS MANAGEMENT

Stress reduction may be accomplished through a set of secondary prevention stress management approaches. Secondary prevention is aimed at altering the individual's or the organization's response to necessary and/or inevitable demands and stressors that cannot be eliminated or removed. Established secondary prevention practices that are well grounded, and have new supportive research in the past 10 years, include relaxation in its many and varied forms, life style approaches that involve physical

exercise and diet, and techniques based on new research on the role of the supervisor in the workplace. Figure 11.5 sets forth the framework for the review in this section.

RELAXATION: REVERSING THE STRESS RESPONSE

To treat stress effectively, a multifaceted approach is required. Although there are many techniques that may temporarily manage the causes or symptoms of stress, no single approach presents an efficient solution. The choice of relaxation techniques to cope with stress should be determined by (1) the specific needs of individuals, and (2) the techniques that best suit those needs.

ABDOMINAL BREATHING

Abdominal breathing allows the individual to fill his/her lungs with oxygen, releasing carbon dioxide, and to downregulate the sympathetic nervous system. Intense emotions, such as anxiety and anger, change the breathing rhythm, which becomes shallow and fast. An effective breathing pattern is fundamental to most forms of relaxation (Fried & Grimaldi, 1993). Other advantages associated with this type of breathing include energy conservation and greater ability to cope with stress and control emotions (Freeman, 2001d). The individual also learns how to better concentrate on what is happening in the here and now (Hendricks, 1995).

PROGRESSIVE MUSCULAR RELAXATION

Progressive muscular relaxation involves the voluntary control of the body's skeletal muscles. The voluntary contraction and relaxation of various muscles allows

individuals to identify the difference between tension and relaxation, thus enabling them to learn to promote muscle relaxation (Jacobson, 1964). Muscular tension is a behavioral response that activates neuromuscular circuits (McGuigan, 1997). The use of progressive muscle relaxation has been shown to help reduce stress level and to alleviate chronic pain in various medical conditions (Freeman, 2001d).

AUTOGENETIC RELAXATION

Autogenetic relaxation is a form of self-hypnosis that can serve as a relaxation technique for controlling responses to a specific stressor (Jencks, 1973). It makes use of the individual's mental control over physiological processes. It consists of creating a passive psychological posture while the individual mentally repeats a series of hypnotic self-messages that can cause physiological changes. The focus is on the body sensations experienced while the individual repeats the self-messages.

MEDITATION

Meditation is a state of consciousness characterized by inward attention and deep relaxation (Murata, Takahashi, Hamada, Omori, Kosaka, & Yoshida, 2004). The practice of meditation is one of the most widely recognized stress management tools and is most often used in stress management programs in the workplace (Murphy, 1996). It consists of focusing the attention on a mantra (string of words) or passive stimulus to "empty the mind" of thoughts while a state of homeostasis is experienced. Meditation can put the body in a profound state of relaxation called hypometabolism. Oxygen consumption, metabolic level, and activation of the sympathetic nervous system are all decreased, as is brain activity. One of the most popular meditation interventions used in the work setting is mindfulness meditation. It involves the production of a state of nonevaluative awareness of the ongoing situation (Shapiro, Astin, Bishop, & Cordova, 2005). For full benefits and to lead to positive behavioral changes, regular practice is required (Freeman, 2001c).

VISUALIZATION

Visualization is a thought with a sensory focus. The word visualize has been used interchangeably with mental imagery, active imagination, and daydreaming. Some of these practices imply the use of spontaneous techniques; others are oriented or induced. All involve the ability individuals have to create an image using their five senses. Visualization can occur even without the presence of a specific stimulus. It can be felt as a sensation or perception and influence mechanisms at the emotional, cognitive, and sensory levels. The relaxation state inhibits mental activity, enabling individuals to focus intensely on the experience.

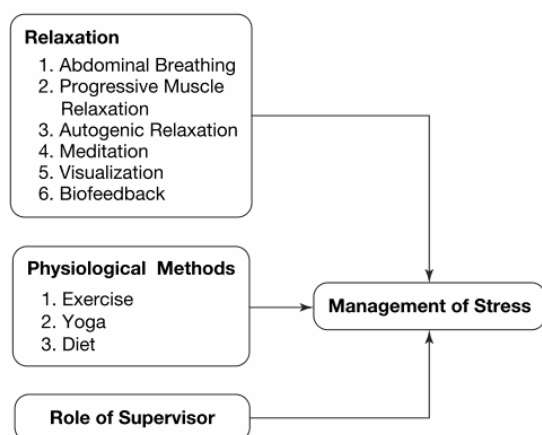


Figure 11.5 ■ Managing stress.

The final outcome is to reduce sympathetic nervous system arousal. Its practice has been effective in the treatment of various illnesses (Freeman, 2001d; Lazarus, 1984).

BIOFEEDBACK

Biofeedback is the immediate return, through electronic sensory devices, of information about physiological processes (heart rate, blood pressure, muscle tension, brain activity, peripheral temperature, electrodermal activity). It enables individuals to regulate their reactions to stress voluntarily by showing when physiological processes are altered. Lehrer, Carr, Sargunraj, and Woolfolk (1994) reviewed the different methods of biofeedback that can be used independently or in conjunction with other methods of relaxation. It is an appropriate tool for the control of reactivity to a specific source of stress (Schwartz, 1995). When individuals learn how to relax and control these physiological processes, the mind is trained to manage the body, thus regulating physical and emotional states (Brown, 1978).

PHYSIOLOGICAL AND PHYSICAL EXERCISE: STRENGTHENING THE PERSON

With the growing demands and pressures at work over the past decade throughout the industrial corridor of Europe–U.S.–Japan and Asia, it is important that professionals take care of their life style, prioritizing physical activity and the quality of their diet.

EXERCISE

One of the best ways to reduce stress is through physical activity such as aerobic exercise. Studies have consistently indicated the numerous emotional and physical benefits of regular exercise activity (2003). Physical activity has been found to have a positive effect on multiple outcomes (Freeman & Lawlis, 2001). It affects brain chemistry, enhances self-esteem and self-confidence, and decreases stress (Blumenthal, Jiang, Babyak, Krantz, Frid, Coleman, Waugh, Hanson, Appelbaum, O'Connor, & Morris, 1997). Aerobic exercise contributes significantly to both physical and mental well-being. Other benefits of systematic physical exercise are increases in motivation and self-discipline.

YOGA

Yoga works with breathing, muscle stretching, concentration, and balance. It differs from other physical exercises in that it places a strong emphasis on both mental and physical fitness. It can reduce stress and relieve muscular tension and pain (Gura, 2002) and improve oxygen consumption and respiration (Telles, Reddy, Nagendra,

2000). Yoga postures have been associated with decreased sympathetic nervous system activity (Vempati & Telles, 2002). The goal of yoga is to make people aware of their body, mind, and physical and mental endurance. The exercises stimulate arterial blood flow everywhere in the body. This process induces the release of tensions, enabling individuals to acquire mental discipline and explore their mental potential.

DIET

A healthy diet balances vitamins, proteins, minerals, fiber, carbohydrates, and fats, as well as overall caloric intake. This provides energy to cells and the raw material for growth, in addition to keeping all organs in order and reconstructing tissues. The diet should include food low in fat, salt, refined sugar, and caffeine. Ideally, meals should be smaller and more frequent. Stress can cause an increased appetite for sweets (Elliott, 1995) and it can affect gastric secretions that are indispensable to good digestion. For this reason one should be relaxed while eating, something that can be difficult under conditions of high work stress.

ADVANCES IN THE ROLE OF THE SUPERVISOR

Command and control leaders and managers are supervisors who can generate stress (Sutton, 2007). The problem with certain supervisors is quite clear and the emotional havoc they wreak in workplace can be enormous. Sutton (2007) therefore argues for building civilized workplaces in which individuals are able to work in healthy emotional relationship, or “resonantly,” to use Boyatzis’s terminology (Boyatzis & McKee, 2005). There is good new research that advances the role of the supervisor as an active, positive force in managing the stress of the workplace. Harris and Kacmar (2005) show the buffering role of supervisors in the perceptions of the politics and strain relationship. That is, while politics can have a negative effect in the workplace, their research with 1,255 respondents in two different organizations found that the supervisor can have a positive buffering effect for subordinates; thus, as we noted earlier, organizational politics need not turn out badly.

POLITICAL AND INTERPERSONAL SKILLS

The political skills of supervisors, their personal and interpersonal skills, and their leadership styles can be powerful and important agents in the workplace for managing the stress process in a healthy, positive way. Perrewé et al. (2004) report evidence that is very important in this regard, suggesting that supervisors who develop positive political skills are able to ameliorate workplace stress before it becomes destructive and distressing. In a similar

vein, Quick, Macik-Frey, and Cooper (2007) suggest that a key ingredient in authentic, resonant leadership development is the process of psychological testing and feedback with regard to emotional competence. The development of emotional competence requires acquisition of the twin skills of intrapersonal intelligence and interpersonal intelligence. Interpersonal skills first require self-awareness, which is an essential foundation to self-management. Both self-awareness and self-management are intrapersonal skills. Emotional self-control is a force multiplier in a leader's job performance and helps relationship building.

SOCIAL SUPPORT ON THE JOB

Social support by supervisors and colleagues in the workplace continues as a perennial positive agent for managing stress, warding off depressive symptoms and other ill psychological outcomes of the stress process. Dormann and Zapf (1999) found this to be the case in a three-wave longitudinal study around Dresden in the former East Germany with a random sample of 543 citizens. Support from supervisors need not be unreasoned and does not obviate either skeptical or critical exchanges. Strong and supportive supervision must be embedded within it the capacity to deliver feedback that can lead to course corrections on the part of subordinates (Nelson & Quick, 2009).

CONCLUSION

The period of 1997–2007 has seen some significant advances in stress science, many of these focused on the causes of stress in the workplace. Work environments in the industrial nations are in many ways less civil than in the past, even if they are physically safer and more secure than they once were. Hence, the nature of the stress is becoming more psychological in nature, though workplace violence is an exception to this rule. We have seen new advances in knowledge of the outcomes of the stress process as well, though much of our previous knowledge continues to be confirmed and elaborated upon. The solid foundation for stress prevention and managing stress that emerged in the late twentieth century has been validated and refined. These skills and interventions are in current practice in many workplace settings. However, there are new advances in both primary prevention and in the secondary preventive stress management skills that help to avert and/or to manage the inevitable, and in some cases necessary, modern workplace stressors.

REFERENCES

- Aboa-Eboulé, C., Brisson, C., Maunsell, E., Masse, B., Bourbonnais, R., Vézina, M., et al. (2007). Job strain and risk of acute recurrent coronary heart disease events. *Journal of the American Medical Association*, 298, 1652–1660.
- Agervold, M., & Mikkelsen, E. (2004). Relationships between bullying, psychosocial work environment and individual stress reactions. *Work & Stress*, 18, 336–351.
- Allen, T. D., & Rush, M. C. (1998). The effects of organizational citizenship behavior on performance judgments: A field study and a laboratory experiment. *Journal of Applied Psychology*, 83, 247–260.
- American Institute of Stress Website: <http://www.stress.org>
- Ashkanasy, N. M., Härtel, C. E., & Zerbe, W. J. (2000). *Emotion in the workplace: Research, theory, and practice*. Westport, CT: Quorum.
- Bacharach, S. B., Bamberger, P. A., & Sonnenstuhl, W. J. (2002). Driven to drink: Managerial control, work-related risk factors and employee problem drinking. *Academy of Management Journal*, 45, 637–658.
- Baltes, B. B., & Heydens-Gahir, H. A. (2003). Reduction of work–family conflict through the use of selection, optimization, and compensation behaviors. *Journal of Applied Psychology*, 88, 1005–1018.
- Barrios-Choplin, B., McCraty, R., Cryer, B. (1997). An inner quality approach to reducing stress and improving physical and emotional wellbeing at work. *Stress Medicine*, 13, 193–201.
- Bell, M. P., Cycyota, C. S., & Quick, J. C. (2002). An affirmative defense: The preventive management of sexual harassment. In D. L. Nelson & R. J. Burke (Eds.), *Gender, work stress, and health* (pp. 191–210). Washington, DC: American Psychological Association.
- Bhagat, R. S. (1983). Effects of stressful life events on individual performance effectiveness and work adjustment processes within organizational settings: A research model. *Academy of Management Review*, 8(4), 660–671.
- Blumenthal, J. A., Jiang, W., Babyak, M. A., Krantz, D. S., Frid, D. R., Coleman, R. E., et al. (1997). Stress management and exercise training in cardiac patients with myocardial ischemia effects on prognosis and evaluation of mechanisms. *Archives of Internal Medicine*, 157(19), 2213–2223.
- Boyatzis, R., & McKee, A. (2005). *Resonant leadership*. Boston: Harvard Business School.
- Brown, B. B. (1978). *Stress and the art of biofeedback*. New York: Bantam Books.
- Cavanaugh, M. A., Boswell, W. R., Roehlin, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among U.S. managers. *Journal of Applied Psychology*, 85, 65–74.
- Chang, C., Johnson, R. E., & Yang, L. (2007). Emotional strain and organizational citizenship behaviours: A meta-analysis and review. *Work & Stress*, 21, 312–332.
- Cordes, C. L., & Dougherty, T. W. (1993). A review and an integration of research on job burnout. *The Academy of Management Review*, 18, 621–656.
- Dansky, B. S., & Kilpatrick, D. G. (1997). Effects of sexual harassment. Sexual harassment: Theory, research, and treatment. In O'Donohue, W. (Ed.), *Sexual harassment: Theory, research, and treatment* (pp. 152–174). Needham Heights, MA: Allyn & Bacon.
- Dormann, C., & Zapf, D. (1999). Social support, social stressors at work, and depressive symptoms: Testing for main and moderating effects with structural equations in a three-wave longitudinal study. *Journal of Applied Psychology*, 84, 874–884.
- Duncan, W. J., Smeltzer, L. R., & Leap, T. L. (1990). Humor and work: Application of joking behavior to management. *Journal of Management*, 16, 255–278.
- Elliott, S. J. (1995). Psychosocial stress, women and heart health: a critical review. *Social Science Medicine*, 40, 105–115.
- Ellis, A., & Harper, R. A. (1975). *A new guide to rational living*. Oxford, England: Prentice-Hall.
- Elovainio, M., Helkama, K., & Kivimäki, M. (2001). Organizational justice evaluations, job control, and occupational strain. *Journal of Applied Psychology*, 86, 418–424.
- Freund, A. M., & Baltes, P. B. (1998). Selection, optimization, and compensation as strategies of life management: Correlations with subjective indicators of successful aging. *Psychology and Aging*, 13, 531–543.

- Fried, R., & Grimaldi, J. (1993). *The psychology and physiology of breathing in behavioral medicine, clinical psychology and psychiatry*. New York: Plenum.
- Freeman, L. W. (2001c). Meditation. In L. W. Freeman & G. F. Lawlis (Eds.), *Mosby's complementary and alternative medicine: A research-based approach* (pp. 166–195). St. Louis: Mosby.
- Freeman, L. W. (2001d). Relaxation therapy. In L. W. Freeman & G. F. Lawlis (Eds.), *Mosby's complementary and alternative medicine: A research-based approach* (pp. 138–165). St. Louis: Mosby.
- Freeman, L. W., & Lawlis, G. F. (2001). *Mosby's complementary and alternative therapy: A research-based approach*. St. Louis, MO: Mosby.
- Grandey, A. A. (2003). When “the show must go on” surface acting and deep acting as determinants of emotional exhaustion and peer-rated service delivery. *Academy of Management Journal*, 46, 86–96.
- Greenburg, M. S. (2006). *Handbook of neurosurgery*, 3rd Ed. Lakeland, FL: Greenberg Graphics.
- Greenhaus, J. H., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of Management Review*, 10, 76–88.
- Griffiths, C. E. M., & Richards, H. L. (2001). Psychological influences in psoriasis. *Clinical & Experimental Dermatology*, 26, 338–342.
- Gura, S. T. (2002). Yoga for stress reduction and injury prevention at work. *Work: Journal of Prevention, Assessment & Rehabilitation*, 19, 3–7.
- Harris, K. J., & Kacmar, K. M. (2005). Easing the strain: The buffer role of supervisors in the perceptions of politics–strain relationship. *Journal of Occupational & Organizational Psychology*, 78, 337–354.
- Hauge, L. J., Skogstad, A., & Einarsen, S. (2007). Relationships between stressful work environments and bullying: Results of a large representative study. *Work & Stress*, 21, 220–242.
- Hemingway, H., & Marmot, M. (1999). Psychosocial factors in the etiology and prognosis of coronary heart disease: Systematic review of prospective cohort studies. *British Medical Journal*, 318, 1460–1467.
- Hochwarter, W. A., Ferris, G. R., Zinko, R., Arnell, B., & James, M. (2007). Reputation as a moderator of political behavior-work outcomes relationships: A two-study investigation with convergent results. *Journal of Applied Psychology*, 92(2), 567–576.
- Hunter, L. W., & Thatcher, S. M. (2007). Feeling the heat effects of stress, commitment and job experience on job performance. *Academy of Management Journal*, 50, 953–968.
- Ingram, J. T. (1954). The significance and management of psoriasis. *British Medical Journal*, ii, 823–828.
- Jacoby, A. (1995). Stress in general practice must be tackled. *British Medical Journal*, 310, 1204–1205.
- Jacobson, E. (1964). *Anxiety and Tension Control*. Philadelphia: J. B. Lippincott Co.
- Jamal, M. (1997). Job stress, satisfaction and mental health: An empirical examination of self-employed and non-self-employed Canadians. *Journal of Small Business Management*, 35, 48–57.
- Jencks, B. (1973). *Exercise Manual for J H Schultz's Standard Autogenic Training and Special Formulas*, Salt Lake City, B Jencks9; available from the American Society of Clinical Hypnosis.
- Johnson, P. R., & Indivik, J. (1994). Workplace violence and issues in the nineties. *Public Personnel Management*, 23(Winter), 515–522.
- Karasek, R., & Theorell, T. (1990). *Stress, productivity and reconstruction of working life*. New York: Basic Books.
- Kivimäki, M., Leino-Arjas, P., Luukkonen, R., Riihimäki, H., Vahtera, J., & Kirjonen, J. (2002). Work stress and risk of cardiovascular mortality: Prospective cohort study of industrial employees. *British Medical Journal*, 325, 857.
- Klunder, C. S. (2008). *Preventive stress management at work: The case of the San Antonio Air Logistics Center, Air Force Materiel Command (AFMC)*. Managing & Leading: SPIM Conference and Institutes, San Antonio, Texas, 29 February.
- Lazarus, R. S. (1984). Puzzles in the study of daily hassles. *Journal of Behavioral Medicine*, 7, 375–389.
- Lehrer, P. M., Carr, R., Sargunary, D., & Woolfolk, R. (1994). Stress management techniques: Are they equivalent, or do they have specific effects? *Biofeedback and Self Regulation*, 19, 353–401.
- LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor-hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal*, 48, 764–775.
- Levi, L., & Levi, I. (2000). *Guidance on work related stress*. Luxembourg: European Commission.
- Levin, P. J. (1993). Assessing posttraumatic stress disorder with the Rorschach projective technique. In J. P. Wilson & B. Raphael (Eds.), *International handbook of traumatic stress syndromes* (pp. 189–200). New York: Plenum Press.
- Lewin-Epstein, N., & Yuchtman-Yarr, E. (1991). Health risks of self-employment. *Work and Occupations*, 18, 291–312.
- Macan, T. H. (1994). Time management: Test of a process model. *Journal of Applied Psychology*, 79, 381–391.
- Maslach, C. (1982). *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice Hall.
- Maudgalya, T., Wallace, S., Daraiseh, N., & Salem, S. (2006). Workplace stress factors and ‘burnout’ among information technology professionals: A systematic review. *Theoretical Issues in Ergonomics Science*, 7, 285–297.
- McGuigan, F. J. (1997). A neuromuscular model of mind with clinical and educational applications. *Journal of Mind and Behavior*, 18, 351–370.
- Murata, T., Takahashi, T., Hamada, T., Omori, M., Kosaka, H., Yoshida, H., et al. (2004). Individual trait anxiety levels characterizing the properties of Zen meditation. *Neuropsychobiology*, 50, 189–194.
- Nelson, D. L., & Quick, J. C. (2009). *Organizational Behavior: Science, The Real World, and You, Sixth Edition*. Macon, OH: South-Western/Cengage.
- Palliser, C. R., Firth, H. M., Feyer, A. M., & Paulin, S. M. (2005). Musculoskeletal discomfort and work-related stress in New Zealand dentists. *Work & Stress*, 19, 351–359.
- Papadelis, C., Chen, Z., Kouridou-Papadeli, C., Bamidis, P., Chouvarda, I., Bekiaris, E., et al. (2007). *Clinical Neurophysiology*, 118, 1906–1922.
- Parslow, R. A., Jorm, A. F., Christensen, H., Rodgers, B., Strazdins, L., & D'Souza, R. M. (2004). The associations between work stress and mental health: A comparison of organizationally employed and self-employed workers. *Work & Stress*, 18, 231–244.
- Pearson, T. A., Mensah, G. A., Alexander, R. W., Anderson, J. L., Cannon, R. O., 3rd, Criqui, M., et al. (2003). Markers of inflammation and cardiovascular disease: Application to clinical and public health practice: a statement for healthcare professionals from the Centers for Disease Control and Prevention and the American Heart Association. *Circulation*, 107, 499–511.
- Peper, E., Wilson, V., Gibney, K., Huber, K., Harvey, R., & Shumay, D. (2003). The integration of electromyography (SEMG) at the workstation: Assessment, treatment, and prevention of repetitive strain injury (RSI). *Applied Psychophysiology and Biofeedback*, 28, 167–182.
- Perrewé, P. L., Zellars, K. L., Ferris, G. R., Rossi, A. M., Kacmar, C. J., & Ralston, D. A. (2004). Neutralizing job stressors: Political skill as an antidote to the dysfunctional consequences of role conflict. *Academy of Management Journal*, 47, 141–152.
- Podsakoff, N. P., Lepine, J. A., & Lepine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *Journal of Applied Psychology*, 92, 438–454.
- Quick, J. C., Macik-Frey, M., & Cooper, C. L. (2007). Managerial dimensions of organizational health: The healthy leader at work. *Journal of Management Studies*, 44, 195–211.
- Quick, J. C., & Quick, J. D. (1984). *Organizational stress and preventive management*. New York: McGraw Hill.
- Quick, J. C., Quick, J. D., Nelson, D. L., & Hurrell, J. J. (1997). *Preventive stress management in organizations*. Washington, DC: American Psychological Association.
- Robinson, V. M. (1991). *The healing power of humor: He who laughs, lasts* [sound recording]. Chicago: American Dietetic Association and Palm Desert, CA: Convention Cassettes Unlimited.
- Rugulies, R., Christensen, K. B., Borritz, M., Villadsen, E., Bültmann, U., & Kristensen, T. S. (2007). The contribution of the psychosocial work environment to sickness absence in human service workers: Results of a 3-year follow-up study. *Work & Stress*, 21, 293–311.

- Saleh, K. J., Quick, J. C., Conaway, M., Sime, W. E., Martin, W., Hurwitz, S. M. D., et al. (2007). The prevalence and severity of burnout among academic orthopaedic departmental leaders. *The Journal of Bone and Joint Surgery*, 89, 896–903.
- Schaubroeck, J., & Jones, J. R. (2000). Antecedents of workplace emotional labor dimensions and moderators of their effects on physical. *Journal of Organizational Behavior*, 21, 163–183.
- Schaubroeck, J., Lam, S. S. K., & Jia, L. X. (2000). Collective efficacy versus self-efficacy in coping responses to stressors and control: A cross-cultural study. *Journal of Applied Psychology*, 85, 512–525.
- Schneider, K. T., Swan, S., & Fitzgerald, L. F. (1997). Job-related and psychological effects of sexual harassment in the workplace: Empirical evidence from two organizations. *Journal of Applied Psychology*, 82, 401–415.
- Schwartz, M. S., (1995). Irritable bowel syndrome. In M. S. Schwartz (Ed.), *Biofeedback: A practitioner's guide*. New York: The Guilford Press.
- Szczesny, S., & Stahlberg, D. (2000). Sexual harassment over the telephone: Occupational risk at call centres. *Work & Stress*, 14, 121–136.
- Selye, H. (1983). The stress concept: Past, present and future. In C. L. Cooper (Ed.), *Stress research* (pp. 1–20). Chichester, England: Wiley.
- Seville, R. H. (1977). Psoriasis and stress I. *British Journal of Dermatology*, 97, 297–302.
- Seville, R. H. (1978). Psoriasis and stress II. *British Journal of Dermatology*, 98, 151–153.
- Seville, R. H. (1989). Stress and psoriasis: The importance of insight and empathy in prognosis. *Journal of the American Academy of Dermatology*, 20, 97–100.
- Shaffer, M. A., Joplin, J. R. W., Bell, M. P., Lau, T., & Oguz, C. (2000). Gender discrimination and job-related outcomes: A cross-cultural comparison of working women in the United States and China. *Journal of Vocational Behavior*, 57, 395–427.
- Shapiro, S. L., Astin, J. A., Bishop, S. R., & Cordova, M. (2005). Mindfulness-based stress reduction for health care professionals: Results from a randomised control trial. *International Journal of Stress Management*, 12, 164–176.
- Shleifer, L. M., Law, R., & Spalding, T. W. (2002). A hyperventilation theory of job stress and musculoskeletal disorders. *American Journal of Industrial Medicine*, 41(5), 298–314.
- Siegrist, J. (1996). Adverse health effects of high effort-low reward conditions. *Journal of Occupational Health Psychology*, 1, 27–41.
- Spell, C. S., & Arnold, T. J. (2007). A multi-level analysis of organizational justice climate, structure, and employee mental health. *Journal of Management*, 33, 724–751.
- Jacoby, A. (1995). Stress in general practice must be tackled. *British Medical Journal*, 310, 1204–1205.
- Stress, coronary disease, and platelet behaviour. *British Medical Journal*, 1, 408.
- Sun, J., Wang, S., Zhang, J., & Li, W. (2007). Assessing the cumulative effects of stress: The association between job stress and allostatic load in a large sample of Chinese employees. *Work & Stress*, 21, 333–347.
- Sutton, R. I. (2007). *The no asshole rule: Guiding a civilized workplace and surviving one that isn't*. New York: Warner Business Books.
- Taris, T. W. (2006). Is there a relationship between burnout and objective performance? A critical review of 16 studies. *Work & Stress*, 20, 316–334.
- Telles, S., Reddy, S. K., Nagendra, H. R. (2000). Oxygen consumption and respiration following two yoga relaxation techniques. *Applied Psychophysiology and Biofeedback*, 25, 221–227.
- University of Michigan Health System Website (<http://www.med.umich.edu/1libr/aha/umpsysom.htm>)
- Van Scotter, J. R., Motowidlo, S. J., & Cross, T. (2000). Effects of task performance and contextual performance on systemic rewards. *Journal of Applied Psychology*, 85, 526–535.
- Van Vegchel, N., de Jonge, J., Bosma, H., & Schaufeli, W. (2005). Reviewing the effort-reward imbalance model: Drawing up the balance of 45 empirical studies. *Social Science & Medicine*, 60, 1117–1131.
- Vempati, R. P., & Telles, S. (2002). Yoga-based guided relaxation reduces sympathetic activity judged from baseline levels. *Psychological Reports*, 90, 487–494.
- Vigoda, E. (2002). Stress-related aftermaths to workplace politics: The relationships among politics, job distress, and aggressive behavior in organizations. *Journal of Organizational Behavior*, 23, 571–591.
- Vaillant, G. E. (1977). *Adaptation to life*. Boston, MA: Little, Brown, and Company.