Prevention of Work-Related Psychological Disorders

A National Strategy Proposed by the National Institute for Occupational Safety and Health (NIOSH)

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ABSTRACT: The National Institute for Occupational Safety and Health (NIOSH) recognizes psychological disorders as a leading occupational health problem. This document, developed by a NIOSH working group led by the present authors, represents a first attempt to fashion a comprehensive national strategy to protect and promote the psychological health of workers. Roles are identified for industry, labor, government, and academia. Key initiatives include (a) steps to improve working conditions and employee mental health services and (b) increased research and surveillance to advance understanding of the problem. Because work-related psychological disorders appear to be a rapidly developing problem lacking complete definition in terms of scope and etiology, this strategy is not to be considered a final statement of NIOSH policy.

With regard to the *physical* health and safety of workers, the work environment is generally viewed as a threat or risk factor. Similarly, work can have adverse consequences for *mental* health, but it can also have an important positive impact. In Western society at least, work experience plays an integral role in psychological development and well-being.

This perspective is aptly expressed by Albert Camus (1955): "Without work, all life goes rotten, but when work is soulless, life stifles and dies." Smith and Smith (1973) claimed that occupations can provide a framework for the organization of behavior. Gardell (1971) suggested that "due to influences exerted by the Protestant ethic and other culturally conditioned factors . . . it is probable that most people perceive work to be one of the most important life areas for the individual's general satisfaction" (p. 149). Psychoanalytic theorists view work as a primary source of self-identity. Lazarus (1981) recounted Erikson's (1963) depiction of Biff, a character in Arthur Miller's *Death of a Salesman,* as suffering "ego-diffusion" for lack of ability to develop a sense of usefulness or productivity (p. 57). Herzberg (1966), McGregor (1960), and Argyris (1964) wrote of motivation, esteem, and self-actualization through work. Lazarus saw another psychologically healthful function of work: a form of coping and refuge and a haven against problems, loneliness, and depression. Several studies on termination from work tend to bear out such tenets. Linn, Sandifer, and Stein (1985) found increased levels of somatization, depression, and anxiety in the unemployed, as well as increased visits to the doctor, medication use, and days in bed.

These considerations add significance to the prevention of work-related psychological disorders and distinguish such efforts from efforts toward the prevention of other occupational injuries and diseases; that is, the promise is not only reduced morbidity, but the potential to actually enhance psychological growth and well-being.

Focus of the Strategy

Disorders of Current Interest

An initial hurdle in developing a national strategy to prevent psychological disorders is a semantic one. The very expression *psychological disorders* connotes a category of problems encompassing a wide array of social, behavioral, and biomedical conditions with diverse and often unknown etiologies. The focus of this strategy is on psychological disorders of general concern in the occupational health arena—those that are commonly investigated under the general rubric of "job stress"[1] and are believed to be amenable to workplace interventions. These are not necessarily conditions that are always identifiable under recognized systems of medical classification, such as the International Classification of Diseases (U.S. Department of Health, Education and Welfare [DHEW], 1968) or the

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[1] There is little consensus or consistency in the interpretation and use of the terms *stress* or *job stress* (sometimes connoting causal factors, sometimes outcomes, and sometimes intermediary processes). It is beyond the intent of this article to resolve the ambiguity. To avoid misinterpretation, an effort is made here to use more precise language. However, for economy of expression the terms *stress* and *job stress* are used sparingly in the text to refer to a body of literature or field of study concerned principally with the adverse physical and mental health effects of psychosocial aspects of work. These terms and their variations (e.g., stressors, negative stress, stressful) also appear enclosed in quotes throughout the text in reference to source literature, but only where the original report does not allow replacement with a less ambiguous term.

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Diagnostic and Statistical Manual of Mental Disorders (*DSM*–III) of the American Psychiatric Association (1980). Nevertheless, they can represent significant functional disturbances or risks for development of clinical disorders. These conditions include (a) affective disturbances such as anxiety, depression, and job dissatisfaction, (b) maladaptive behavioral and life-style patterns, and (c) chemical dependencies and alcohol abuse.

The strategy is less concerned with the area of chronic mental illness because occupational causation of those illnesses is not well documented. Furthermore, those problems frequently require removal from the work force or hospitalization, making workplace interventions for their control difficult. The strategy is not concerned with disturbances of psychological functions attributable to organic, genetic, or neurologic pathogenesis, although such mechanisms do not preclude a workplace basis (e.g., exposure to neurotoxic chemicals). Some of these problems are treated in other National Institute for Occupational Health and Safety (NIOSH) prevention strategies, for example, the prevention strategies for neurotoxic disorders and disorders of reproduction (NIOSH, 1988). Finally, many acute and chronic somatic disorders are widely accepted as having a basis in job stress, notably cardiovascular disease (CVD). Beyond the recognition of CVD and other somatic disturbances as potential manifestations or sequelae of psychological disorders, the present strategy is confined to disorders in the psychological–behavioral domain. (CVD is the subject of a separate NIOSH prevention strategy, NIOSH, 1985.)[2]

Occupational Connection and Prevention Focus

The occupational involvement in psychological disorders is not a matter of dispute in the mental health community. "Psychosocial stressors," specifying "occupational stress," as a major diagnostic axis is listed in the DSM–III. The present prevention strategy is particularly concerned with psychological disorders that bear a relation to working conditions. At the same time, the strategy acknowledges the interplay of work and nonwork factors in the etiology of psychological disorders and the difficulty of attributing psychological disorders exclusively to either domain. Accordingly, the strategy not only focuses on the understanding and control of job factors that contribute to psychological disorders in workers, but through promotion of improved workplace mental health services, strives also to remedy workers' psychological disorders regardless of a clear occupational basis.

This approach is consistent with current perspectives on the domain of occupational medicine. In the 1983 George H. Gehrmann Lecture to the American Occupation Medicine Association, Collings (1984) noted a "relentless" trend toward a "fuzzier and fuzzier" boundary between the occupational and nonoccupational in terms of etiology and treatment of disease (p. 511). Collings asserted that no medical condition escapes the influence of eight hours of daily work. Moreover Hilker (Hilker & Asma, 1975), speaking as medical director of Illinois Bell, declared that industry has both a responsibility and business interest (citing costs of personnel and productivity problems) in rehabilitating employees for psychological disorders. Hilker also suggested that rehabilitative efforts may be more effective when conducted in an occupational (as opposed to a community) setting.

Scope of Psychological Disorders as a National Health Problem

Currently, no surveillance system exists to adequately gauge the national scope of psychological health disorders. The best estimate to date of the magnitude of psychological disorders as a national health problem stems from data in the National Institute of Mental Health (NIMH) Epidemiologic Catchment Area study (Freedman, 1984). In this study, 17,000 community residents at five regional sites were interviewed using the Diagnostic Interview Schedule (Robins, Heltzer, Croughan, Williams, & Spitzer, 1981). The results are sobering. First reports indicate a six-month prevalence of psychological disorders about equal to the prevalence of hypertension. Specifically, from 17% to 23% of adults were found to have been afflicted with one or more of over a dozen major psychological disorders listed in the *DSM*–III; from 7% to 15% of adults were found to have had one or more of the various anxiety disorders alone, and rates for substance abuse were 6% to 7%. Lifetime prevalence rates were considerably higher (29% to 38% for major disorders). Psychological disorders were most common among adults during the prime working age of 25 to 44 years. These findings reinforce earlier estimates of a population prevalence rate for psychological disorders approaching 25% (President's Commission on Mental Health, 1978).

Other indicators affirm the importance of psychological disorders as a growing national problem. Research by NIOSH has shown that mental disorders were the third most disabling condition among Social Security Administration (SSA) disability allowance recipients for the period 1975–1976, preceded only by musculoskeletal injuries and circulatory diseases (Fishbach, Dacey, Sestito, & Green, 1986.) Fully 11% of all SSA disability allowances were for mental disorders. By 1988, mental disorders had become the most prevalent disabling condition among SSA disability allowance recipients, accounting for 21% of all allowances (Social Security Bulletin, 1989). In a 1985 study of medication use, Valium was the fourth most commonly prescribed drug in the United States ("Top 200 Drugs," 1985). Two of the three most frequently prescribed drugs are specific for the treatment of hypertension, a condition that can have a psychological component. In general, psychotherapeutic agents ac-

[2] Although somatic disease is excluded from this strategy, specific attention should be given to the increasing body of evidence linking physical illness and psychological factors. Recent developments in the field of psychoimmunology are most striking. A review by Marx (1985) described pervasive anatomic and biochemical links between the immune and nervous systems to explain the influence of mood on susceptibility to disease. Suggested declines in immune function even with "commonplace stressors" are of particular interest (Kiecolt-Glaser, 1985; Kiecolt-Glaser, Speicher, Holliday & Glaser, 1984).

counted for one fourth of all outpatient prescriptions in 1984 (Baum, Kennedy, Knapp, & Faich, 1985).

Patterns observed in the use of health services add to the evidence. In a National Ambulatory Medical Care Survey of office visits to internists during 1980–1981, Cypress (1984) found that 3.3% of all visits resulted in diagnoses of mental illness. The percentage was nearly double for the 25- to 44-year age group. According to a 1980 study of patient needs in community primary care centers, the most common request for health care involved psychosocial problems (Good, Good, & Massi, 1983). A study among members of a health maintenance organization in the Washington, DC area found that the health education topic "anxiety and stress" was most preferred by members of both sexes (Nickalson, Donaldson, & Oh, 1983).

Complementing this finding, the results of the 1985 National Health Interview Survey showed that 75% of the general population reported experiencing at least "some stress" in the two weeks preceeding the survey. About one half of the respondents reported "a lot" or "moderate amounts" of stress during this period (Silverman, Eichler, & Williams, 1987).

Psychological Disorders as an Occupational Health Concern

Economic impact is another measure. Costs for direct care of mental illness are reported to exceed $36 billion annually ("Giving Mental Health," 1986).

Epidemiologic and health care data on costs are accumulating to provide an increasingly clear picture of the occupational relevance—both cause and costs—of psychological disorders.

Occupational gradients with respect to mental health have long been known. Mental disturbances are most heavily concentrated among workers with lower income, lower educational level, fewer skills, and less prestigious jobs (Fried, 1975; Langner & Michael, 1963). Similar gradients are apparent for alcoholism (Fillmore & Caetano, 1982; Guralnick, 1963). Quinn and Staines (1979) found an appreciable drop in job satisfaction among U.S. workers during the 1970s. Virtually all occupational and demographic subclasses were affected. Results of the 1985 National Health Interview Survey (Shilling & Brackbill, 1987) revealed that an estimated 11 million workers reported health-endangering levels of "mental stress" at work. Only one other hazardous work condition (loud noise) was found to be more prevalent.

Findings in other Western industrialized countries reinforce the U.S. experience. Data collected during the 1970s indicated that about one fourth to one third of Swedish workers viewed their work as often "stressful" or reported moderate to high levels of "stress" at work (Bolinder & Ohlstrom, 1971; Wahlund & Nerell, 1976). In a nationwide Canadian study (Canadian Mental Health Association, 1984), 60% of the workers studied reported they had experienced "negative stress" at work within the previous year and 35% reported "adverse psychological effects." Only 11% reported adverse physical effects. Again, such reactions were most common in the age range of 25 to 44 years.

Going beyond these generalizations, more precise analyses reveal that specific occupations and job factors present particular risks. Health professionals (e.g., physicians, dentists, nurses, and health technologists) have higher than expected rates of suicide (Guralnick, 1963; Milham, 1983) and of alcohol and drug abuse (Hoiberg, 1982). Nurses and other health care workers have increased rates of hospital admissions for mental disorders (Gundersson & Colcord, 1982; Hoiberg, 1982) and elevated admission rates to mental health centers (Colligan, Smith, & Hurrell, 1977). Burnout is particularly prevalent among health, human service, and teaching professionals (Maslach, 1982). A wide range of working conditions have been associated as job-risk factors for adverse affective states and job dissatisfaction. Examples include role stressors (Jackson & Schuler, 1985) and demands in excess of control (Karasek, Schwartz, & Theorell, 1982). Further discussion of job-risk factors is provided in the section on job design.

Data on workers' compensation provide a particularly striking indicator of the magnitude of psychological disorders as an occupational health issue. In general, claims for psychological disorders that result from job experiences multiplied over the 1970s. According to Lublin (1980), the State of California alone received 3,000 to 4,000 psychiatric injury claims in 1979, one half of which resulted in monetary awards. The prevalence of one specific type of claim, "gradual mental stress," has shown a dramatic increase in recent years.[3] The California Workers' Compensation Institute (1983, cited in National Council on Compensation Insurance, 1985, p. 5) reported that such claims more than doubled from 1980 to 1982, whereas claims for all other disabling injuries actually decreased by more than 10%. According to a study by the National Council on Compensation Insurance (1985), claims for gradual mental stress alone account for about 11% of all claims for occupational disease. That study also showed that in the period from 1981 to 1982, costs of workers' compensation for gradual mental stress reached, and then surpassed, the average cost of claims for other occupational disease.

Total costs for psychological disorders in terms of medical services, employment, and productivity are far more elusive. Several sources agree, however, that such costs in the United States run in the tens of billions of dollars annually (Harwood, Napolitano, Kristiansen, & Collins, 1984; Wallis, 1983; Yates, 1979). These sources suggest that adding in the costs of physical health problems related to psychological disorders brings the total bill to $50–$100 billion annually.

[3] The expression *gradual mental stress* is used in the field of workers' compensation insurance to refer to cumulative emotional problems that stem mainly from exposure to adverse psychosocial conditions at work. Emotional problems related to a specific traumatic event at work—such as witnessing a severe accident—or to work-related physical disease or injury are not included.

Emerging trends in the economy, in technology, and in the demographic characteristics of the work force may result in increased risk for psychological disorders. Some of the more evident trends, with a description of their implications, follow.

1. Of the 20 fastest growing occupations, one half are related to the health and computer fields. A 26% increase is projected for health services in the decade 1985–1995, with an increase of 33% for registered nurses and 29% for nurses' aides, orderlies, and attendants (Silvestri & Lukasiewicz, 1985). As noted earlier, health service professionals, and nurses in particular, have consistently shown elevated risks for psychological disorders. Regarding the computer field, Bezold, Carlson, and Peck (1986) have cited data indicating that computers and robots will probably affect 7 million factory jobs and 38 million office jobs. According to these observers, the projected effects will include job displacement, deskilling, and lower paying jobs, each of which has implications for psychological well-being.

2. Of every 10 new jobs between 1985 and 1995, 9 will be in the service sector (Bureau of Labor Statistics, 1985), an area already shown to be at increased risk for psychological disorders (Colligan et al., 1977). Furthermore, workers in routine service jobs will probably not gain the compensation and benefits awarded to workers in the traditional industrial and manufacturing jobs (Bezold et al., 1986; Pederson, Sieber, & Sundin, 1986).

3. Of every 10 new jobs between 1985 and 1995, 6 will be filled by women, and the proportion of women will continue to increase to 46% of the work force (Fullerton, 1985). Because of role demands and constrained occupational opportunities, this trend may have an adverse impact on mental health.

4. According to Silvestri and Lukasiewicz (1985), the five occupations with the greatest number of new jobs by 1995 will be cashiers, registered nurses, janitorial workers, truck drivers, and waiters and waitresses. Many jobs in this cluster provide limited opportunity for growth and development, and limited availability of benefits.

Conceptual Basis for the Prevention Strategy

A prevention strategy for health disorders must take account of both causal mechanisms and factors that perpetuate the disorders. Generic approaches tend to focus on the interplay of host, agent, and contextual factors. One such approach, the Canadian Health Field Model, which has received wide attention as a framework for understanding and attacking the causes of ill health, is particularly suited as the basis of a prevention strategy for psychological disorders (Lalonde, 1974).[4] The Quebec Social and Family Affairs Council (1984) reported the most current interpretation of the Canadian Health Field Model, identifying three main categories of variables: (a) individual factors (physiological and psychological characteristics as determined by biological and hereditary factors); (b) environmental factors (aspects of the physical, social, economic, and working environments); and (c) health care systems (quantity, arrangement, and nature of health care).

This model views health as a process of adjustment between the individual and the environment. Psychological disturbances are considered a manifestation of imbalance between the individual and the environment and are eased or exacerbated depending on the health care available. The Quebec interpretation departs from the original formulation (Lalonde, 1974) in its treatment of one category of variables: unhealthy behaviors or lifestyles. In the original model, these factors are considered as acts of deliberate exposure to risks, whereas in the Quebec interpretation they more accurately represent consequences of stress.

This model of the health process is consistent with formulations in the contemporary theory on stress and with empirical observations. The basic concept in most current approaches to job stress embodies an unfavorable interaction between worker attributes and job conditions that leads to psychological disturbances and unhealthy behaviors and ultimately to physiological ill health (Caplan, Cobb, French, Harrison, & Pinneau, 1975; Cox, 1978; Gardell, 1971; Karasek et al., 1982; Levi, 1981). Research findings confirm this view on a general level. Both physical and psychosocial job characteristics have been shown to play a role in the etiology of work-related psychological disturbances. These factors operate in concert with other factors—such as stressful life events or familial demands and support—and with the physical and psychological traits, capacities, and needs of the workers (personality, age, gender, experience, learning, etc.). The interplay among these variables is complex, however, and the relative influence of the different classes of variables is not thoroughly understood.

The current understanding of psychological health processes, as described earlier, suggests key elements in a prevention strategy for work-related psychological disorders. These elements include abatement of known job (environmental) risk factors, research to improve understanding of these risk factors, surveillance to detect and track risk factors and to identify occupational groups at risk, and education to improve the recognition of risk factors and their control. At the same time, efforts are needed to improve mental health services for workers.

Components of the Prevention Strategy

Various methods for preventing work-related psychological disorders are classified here into four somewhat distinct categories of action: (a) job design to improve working conditions; (b) surveillance of psychological disorders and risk factors; (c) information dissemination, education, and training; and (d) enrichment of psychological health services for workers.

[4] The Canadian Health Field Model was adopted in 1979 by the U.S. Surgeon General for analyzing the 10 leading causes of death in the United States (U.S. Department of Health, Education and Welfare, 1979), and in 1985 by the National Institute for Occupational Safety and Health (NIOSH) for developing a strategy to combat work-related musculoskeletal injury (NIOSH, 1985).

The following discussion covers the limits of current knowledge and practice and the strategic (prevention) initiatives that derive as consequences in each area. Research is considered under each activity as needed. To help facilitate implementation, the recommendations are stated in concrete terms that identify the specific actors and actions needed, whenever possible. Several recommendations, however, by their nature defy such specificity (e.g., general policy matters, generic research, and broad classes of organizations or activities).

Job Design To Improve Working Conditions

The literature on occupational stress and health identifies a wide range of working conditions, both physical and psychosocial, that pose a threat to psychological well-being. Physical aspects include neurotoxic agents and physical and ergonomic characteristics of the task and workplace. The NIOSH (1974, 1977) National Occupational Hazard Survey estimated that nearly 12.5 million U.S. workers face exposure to metals and organic compounds (mercury, lead, solvents, etc.) known to cause psychological disorders. Psychological problems secondary to the physical disorders that arise from poor ergonomic conditions are increasingly apparent, as seen in recent research on office automation (Grandjean, 1983). Prevention efforts for controlling health problems, including psychological effects, that result from exposure to neurotoxic and physical and ergonomic risk factors are treated in separate NIOSH strategies for preventing leading work-related diseases and injuries (NIOSH, 1985, 1988).

With respect to job design, the present strategy focuses principally on psychosocial factors. Although *psychosocial* has not been succinctly defined in reference to working conditions, in general usage it connotes the social environment at work, organizational aspects of the job, and the content and certain operational aspects of the tasks performed. Unlike neurotoxic agents and ergonomic hazards, hazards involving psychosocial factors respect no occupational boundaries. Thus, the potential for exposure to this class of health risks is ubiquitous, and a great many psychosocial factors have been identified as potentially hazardous. The most firmly established of these, in terms of quantity and convergence of evidence, are discussed in the following section.

Knowledge of Psychosocial Risk Factors: The Status Quo

Work load and work pace. Although some evidence exists that work load per se is associated with negative health outcomes (Theorell & Rahe, 1972), the load or rate does not seem to be as critical as the amount of personal control or discretion exercised over these demands. Evidence is growing that control is the decisive factor in determining the health consequences of work demands, so that adverse effects occur when control is not commensurate with demands (Sauter, Hurrell, & Cooper, 1989). Similarly, research on the degree of participation in making decisions suggests that emotional distress, lowered self-esteem, and job dissatisfaction result from nonparticipation of workers (Margolis, Kroes, & Quinn, 1974; Spector, 1986).

Research on machine-paced work (involving limited worker control of the job demands) has indicated, from the beginning, a link with adverse health effects. Reports from early field studies showed a variety of negative psychological reactions (job dissatisfaction, tension, etc.) in machine-paced work (Hurrell & Colligan, 1987; Salvendy & Smith, 1981). In a NIOSH-sponsored study of 23 occupations (Caplan et al., 1975), machine-paced assembly workers reported the highest levels of anxiety, depression, and irritation, as well as more frequent somatic complaints.

Work schedule. Substantial evidence indicates that the temporal scheduling of work can have a significant impact on psychological, behavioral, social, and physical well-being. Rotating shifts and permanent night work, in particular, have been linked to a variety of such disturbances (Johnson, Tepas, Colquhoun, & Colligan, 1981; Monk & Tepas, 1985; Rutenfranz, Colquhoun, Knauth, & Ghata, 1977). These shift-related complications have been attributed to a disruption of physiological circadian rhythms and social interactions resulting from a work schedule that is at odds with the normal diurnal activity cycle (Aschoff, 1981).

Role stressors. National survey data suggest that role ambiguity is prevalent in many organizations (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). According to these data, men who experienced role ambiguity reported lower self-confidence, higher job tension, and lower job satisfaction. Role conflict has been similarly linked to job tension and dissatisfaction (Jackson & Schuler, 1985). Research has also linked role ambiguity to indicators of mental ill health, including depressed mood, dissatisfaction with life, tension, anxiety, and resentment (Caplan & Jones, 1975; Van Sell, Brief, & Schuler, 1981), and to adverse psychophysiological states such as increased heart rate and blood pressure (French & Caplan, 1970).

Career security factors. Several conditions associated with career development and job future (lack of job security, under- or overpromotion, fear of job obsolescence, and early retirement) have been related to adverse psychological effects (e.g., low job and life satisfaction, low self-esteem) as well as poor physical health (Kasl & Cobb, 1982; Margolis et al., 1974; Sutherland & Cooper, 1988).

Interpersonal relations. Poor relationships with colleagues, supervisors, and subordinates at work have been identified as important risk factors (Beehr & Newman, 1978; Davidson & Cooper, 1981; Pearse, 1977). Social relationships both at work and outside the workplace are most commonly viewed as playing a moderating role, and adverse effects of exposure to job risk factors are more likely or pronounced when relationships provide little support (Cobb & Kasl, 1977; Cohen & Willis, 1985; House & Wells, 1978). For example, a study of more than 1,000 male workers showed that support from supervisors and coworkers buffered the effects of job demands on depression and job dissatisfaction (Karasek et al., 1982).

Other research indicates a more direct effect of social support in offsetting the effects of adverse working conditions (Ganster, Mayes, & Fusilier, 1986).

Job content. The nature of the tasks performed has critical implications for psychological well-being. In particular, narrow, fragmented, invariant, and short-cycle tasks that provide little stimulation, allow little use of skills or expression of creativity, and have little intrinsic meaning for workers have been associated with job dissatisfaction and poor mental health (Cox, 1985; Gardell, 1981; Levi, 1981).

Intervening variables. The effects of the aforementioned factors on psychological well-being must be considered in the context of situational and personal variables that originate outside the job. Although these outside factors are not amenable to control through job design, they should be recognized here because of their potential interaction with job factors. Life events and the Type A behavior pattern are two such variables. Risk factors outside the work environment such as family problems, financial difficulties, and major life changes have been linked to a host of physical and psychological disorders (Dohrenwend & Dohrenwend, 1974). Although the Type A behavior pattern (characterized by a sense of competitiveness, time urgency, and overcommitment) may be fostered by a stressful job, it is also possible that individuals with this tendency select themselves into particularly demanding jobs.

Recommendations for Controlling Psychosocial Risk Factors at Work

Although it cannot be said that an understanding of work-related risk factors for psychological disorders is complete or that further study is unwarranted, knowledge is sufficiently advanced to permit more concerted action toward the control of risk factors at the work site. Training and technology transfer, to be treated later in this article, is particularly important, as is continuing research to hone our knowledge further and to investigate emerging problems.

Motivational and leadership efforts are equally important, however, and are the primary subject of discussion here. Although government agencies and industry organizations have provided direction in the control of physical workplace hazards, psychosocial aspects of the job have received little attention. In particular, recommendations in this area have never been issued at the national level. The generalizations below are based on existing knowledge and converging opinion on risk factors, and are offered as candidates for such recommendations. The intent here is not to define specific actions for intervention because the nature of such actions will vary depending on several factors (e.g., industry, organizational level). Rather, the aim is to offer positive principles to guide the design of jobs in the interests of improving mental health. Although research has demonstrated these principles to be effective, some work situations may not be readily amenable to the needed interventions. Furthermore, the underlying risk factors can be interrelated, and successful intervention will require attention to more than one of these principles.

Work load and work pace. Demands (both physical and mental) should be commensurate with the capabilities and resources of individuals, avoiding underload as well as overload. Provisions should be made to allow recovery from demanding tasks or for increased job control under such circumstances. Increased control by the individual over the pace of work is one example of a positive step.

Work schedule. Work schedules should be compatible with demands and responsibilities outside the job. Recent trends toward flextime, a compressed work week, and job sharing are positive steps. When schedules involve rotating shifts, the rate of rotation should be stable and predictable and should be in a forward (day-to-night) direction.

Work roles. Roles and responsibilities at work should be well defined. Job duties need to be clearly explained, and conflicts in terms of job expectations should be avoided.

Job future. Ambiguity should not exist in matters of job security and opportunities for career development. Employees need to be clearly informed of promotional opportunities and mechanisms for improving skills or professional growth within the organization, as well as impending organizational developments that may potentially affect their employment.

Social environment. Jobs should provide opportunities for personal interaction both for purposes of emotional support and for actual help as needed in accomplishing assigned tasks.

Content. Jobs should be designed to provide meaning, stimulation, and an opportunity to use skills. Job rotation or increasing the scope of work are examples of steps to improve narrow, fragmented work activities that fail to meet these criteria.

Participation and control. Individuals should be given the opportunity to have input on decisions or actions that affect their jobs and the performance of their tasks.

Research Needs

Other steps, beyond formulating and promulgating such recommendations, can help implement improved job design.

1. NIOSH can work directly with industry, through mechanisms for technical assistance or cooperative agreements, to study problematic situations and to develop and install solutions.

2. Intervention studies are needed to evaluate the effects of psychosocial job enhancement in terms of psychological well-being. These studies should also examine performance outcomes and related bottom-line measures that are important for motivating industry to action. Beyond an incentive to improve working conditions, research of this nature can also provide models and direction to help guide the implementation of psychosocial improvements.

3. More basic study is needed on the role of extraorganizational factors vis-à-vis job-design factors, as they

affect psychological well-being. Continuing research is also needed to examine the impact of technologic developments (e.g., increasing use of computer automation and the use of robots in work processes) and their potential for adverse as well as positive effects on job design and subsequent psychological effects. Logically, organizations that develop and promulgate such technology should bear a responsibility in supporting the research effort.

As an important related issue, this research must come to grips with several methodologic problems associated with research on occupational stress. Important advances in research include (a) increased use of longitudinal prospective and follow-up research designs of psychological outcomes; (b) development of more standardized methods for assessing psychosocial risk factors on the job; (c) greater adherence to the use of standard psychometric instruments in assessing psychological outcomes; (d) more extensive use of collateral measures both for working conditions (e.g., assessments by coworkers, managers, objective measurements) and the indicators of psychological health effects (e.g., self-reports, medical and personnel records, psychophysiological measures, performance, attendance, and supervisory and peer evaluations); (e) increased efforts through representative sampling procedures and replication to assure that the findings will have general application (e.g., the use of multiple work sites or industries in the investigation of a particular occupation or job dimension); and (f) increased use of advanced statistical methods, such as structural analysis, to improve the understanding of causal mechanisms and pathways.

Surveillance of Psychological Disorders and Risk Factors

Any strategy for preventing health disorders has a central need for ongoing surveillance of disorders and risk factors to detect and react to emerging problems and to evaluate interventions. Current surveillance systems are insufficient to identify work-related psychological disorders adequately or to aid in their prevention.

Surveillance: The Status Quo

Surveillance of psychological disorders. Although reports cited earlier in this article give some indication of the prevalence of psychological disorders as an occupational health problem, most are only suggestive at best. Many information sources lack the continuity, breadth, and specificity required for effective surveillance of occupational psychological disorders. However, two nationwide studies conducted by the National Center for Health Statistics (NCHS)—the National Health Interview Survey (NHIS) and the National Health and Nutrition Examination Survey (NHANES)—offer some potential for surveillance of psychological disorders. Although neither study was designed specifically for surveillance of psychological disorders, both collect limited data on psychological disorders, occupation, and industry. Thus far, however, these data bases have not been used specifically for surveillance of occupational mental health. For example, NCHS does not routinely provide cross tabulations of psychological disorders by occupation or industry in its published reports.

The Epidemiological Catchment Area (ECA) program sponsored by NIMH represents a recent, comprehensive attempt to assess the prevalence of major psychiatric disorders as classified by the *DSM*-III (Freedman, 1984). This program involved interview surveys conducted in households at five sites across the country. Follow-up interviews at six-month and one-year intervals also made possible the determination of incidence rates for mental disorders. Although occupation and industry data were obtained in the survey, the collection process for this information was not standardized. Another limitation was that only current occupation, rather than occupational history, was recorded. Finally, NIMH has no plans to repeat the ECA survey at regular intervals.

Also at the national level, data from the Social Security Administration on disability allowances hold potential for tracking psychological disorders in relation to occupations. As noted earlier, NIOSH has used these data to investigate occupational differentials in disabling conditions. NIOSH is currently studying whether SSA allowance data can be used to track psychological disorders.

Workers' compensation systems at the state level have not been used extensively to track psychological disorders in relation to occupational factors.[5] Reasons for this include a lack of uniformity across the states in diagnostic criteria and in laws governing the compensability of psychological disorders. Moreover, these data are not easily retrievable.

Surveillance of job risk factors. The Quality of Employment Surveys sponsored by the Department of Labor in 1969, 1973, and 1977 constitute the only nationally representative effort to monitor working conditions and to explore quality-of-work-life issues (Quinn et al., 1971; Quinn & Shepard, 1974; Quinn & Staines, 1979). This series of household surveys solicited information on a broad range of factors that contribute to the quality of work life. Topic areas included job content, job security, participation, earnings and fringe benefits, and health and safety concerns. No such surveys have been conducted since 1977.

Recommendations for Improving Surveillance

The following recommendations are offered to improve existing practices for surveillance of occupational psychological disorders and for surveillance of occupational conditions that place workers at risk for psychological disorders.

National level. (a) The Department of Labor should reinstitute Quality of Employment Surveys in conjunction with NIOSH to monitor the prevalence of risk factors in the workplace. More extensive data on psychological disorders should be collected in these surveys. (b) NIOSH

[5] California is one exception. Similar activities have also been undertaken by the National Council on Compensation Insurance, an organization linked to compensation insurance underwriters.

should work with NCHS to improve the usefulness of NCHS surveys for surveillance of occupational mental health. Similarly, input to the NIMH ECA program should be explored. (c) NIOSH should consider adding suicide and alcohol/drug abuse to the list of Sentinel Health Events (Occupational), thereby stimulating an awareness and recording of these events in relation to occupational factors (Rutstein et al., 1983). (d) A national clearinghouse is needed to identify and disseminate information on sources of data that contain information on psychological disorders with respect to occupation.

State level. (a) Data on risk factors for psychological disorders could be collected and organized by industry or occupation through the Centers for Disease Control (CDC) Health Risk Appraisal Network with state health departments. (b) The National Association of State Mental Health Directors should initiate efforts to assemble data on psychological disorders for surveillance of occupational mental health. (c) Workers' compensation data bases should be evaluated to identify high-risk occupations or industries.

Industry level. (a) Health examinations of employees should note psychological health status to help detect emerging problems. Data on working conditions should be recorded at the same time so that organizational risk factors can be identified. (b) In general, data from health care providers (e.g., employee assistance programs [EAPS], company medical departments) should be used in aggregate (to assure confidentiality) for organizational or industry surveillance of psychological disorders and risk factors. (c) Assessments for workplace safety and industrial hygiene should be expanded to incorporate workplace risk factors for psychological disorders.

Information Dissemination, Education, and Training

Prevention of work-related psychological disorders ultimately depends on the qualifications and resources that permit individuals to recognize psychological disorders and the underlying risk factors, and enable them to implement control measures. Individuals who play a principal role in this capacity include workers, management personnel, labor and corporate safety and health personnel, and health professionals in the community. The specific informational and training needs of these individuals can vary according to their role, but should encompass awareness and appreciation of psychological disorders as an occupational health problem, understanding of work and nonwork risk factors, recognition of individual signs and organizational manifestations of psychological disorders, reduction of stressful working conditions and personal risks, and treatment of psychological disorders.

The Status Quo

Scientific concern with the subject of occupational mental health has grown steadily from its roots in the human relations movement of the 1930s. Despite a now vast literature in this area, however, the role of work experience in the etiology of psychological disorders has received little formal attention in educational programs of the medical, mental health, management, or occupational safety and health community. Only recently, for example, have occupational factors been classified as etiologic agents for psychological disorders by the American Psychiatric Association (1980). Education for occupational safety and health personnel has historically focused on physical and chemical hazards in the work environment, with little consideration for the potential mental health consequences of working conditions. At present, only one major scientific journal focuses on the general subject of job stress,[6] and practical or tutorial literature in this area is almost nonexistent.

A NIOSH-funded project conducted in 1982 provides a rather dismal picture of the training of workers in mental health issues (Neale, Singer, Schwartz, & Schwartz, 1983). Although extensive corporate development of employee health programs was noted in the 80 corporate and labor organizations studied, the investigators drew the following conclusions about training opportunities in the area of occupational stress:

> First, there has been little done to educate *blue collar workers* about workplace stressors of both a physical and psychosocial nature. Similarly, both labor and corporate organizations have invested little time or money toward training workers in how to change or cope with stressful conditions at work. (Neale et al., 1983, p. 2)[7]

The report also concluded that existing programs tend to be targeted at middle or executive management and maladaptive health behavior (e.g., substance abuse), and use brief presentations of the "workshop" variety that do not undergo evaluation. Some notable exceptions to this pattern exist. For example, NIOSH maintains publication, training, and information-dissemination activities on occupational health issues, including occupational stress. Several labor institutes (e.g., University of Wisconsin School for Workers, Oakland Institute for Labor and Mental Health) have been involved with training and information dissemination in the areas of work and mental health. On balance, however, prospects are poor for advances in training and development of general human resources in occupational mental health. Regressive developments are even evident. For example, NIMH recently disbanded the short-lived Center for Work and Mental Health, a program focusing on work and mental health issues.

Recommendations

Needs are evident for increased training opportunities, increased information availability, and further dedication

[6] Taylor and Francis began publication of a periodical entitled *Work and Stress* in 1987. However, numerous other journals (e.g., *Journal of Applied Psychology, Journal of Occupational Psychology*) accept articles on job stress.

[7] This situation may be changing. A recent national survey found that 26% of work sites polled offered some type of stress management program (Office of Disease Prevention and Health Promotion, 1989).

of relevant organizations regarding issues of work and mental health. Avenues and suggestions for improvement in each of these areas include the following.

Training, education, and the development of training and educational materials. Worker education is needed, principally about indicators of psychological disorders and job factors that increase the risk for psychological disorders. A need also exists for educating managers in the mental health consequences of poor job design and for training managers in the work-related causes of psychological disorders and the necessary control measures. It is particularly important that such training and education reach top management and labor levels. The training and educational needs of occupational health care professionals include recognition of occupational risk factors for psychological disorders, and management practices that impact on occupational mental health. At the same time, mental health professionals in general need to be educated about occupational psychological disorders.

Both NIOSH and OSHA support several programs that can be more fully exploited for these purposes. Training and education opportunities for safety and health professionals can be increased in the general area of work and mental health in the context of NIOSH-funded university programs such as the Educational Resource Centers (ERCs) through NIOSH professional intramural direct-training courses or through cooperative agreements between NIOSH and schools of public health. Guidelines for ERCs could include a requirement for advanced education in occupational mental health issues. Certifying boards should be encouraged to include this content in qualifying examinations. In general, professional societies and accreditation organizations need to promote greater attention to occupational factors in training mental health personnel (e.g., clinical psychologists, psychiatrists, social workers) and occupational health personnel, particularly occupational nurses and physicians.

Increased training in job design, as it relates to psychological well-being, for management and engineering personnel could be promoted through the NIOSH projects Minerva and SHAPE (Safety and Health Awareness for Preventive Engineering), which are designed to enrich the curricula of business and engineering schools, respectively, in occupational health and safety topics. Industrial engineering programs, in particular, need to be targeted. The OSHA funding of labor centers and training-grant programs provides an important mechanism for enriching education at the worker level in the areas of work and mental health.

Funding under the foregoing mechanisms should be channeled not only to deliver training and education but also to develop training and educational materials. Although extensive theoretical and research literature exists in the job stress area, accumulated scientific knowledge has not been translated into applied information in the form of practical guidelines, procedures, and manuals. The need is perhaps most acute for worker-oriented educational material.

Dissemination of information. NIOSH provides technical and reference information on occupational safety and health, including the subject of occupational stress, through its public-access data bases (NIOSH Document Information Directory System [NIOSHTIC]) and the NIOSH Publications Clearinghouse. Some of this information has been prepackaged in the form of special bibliographies by subject areas, for example, "health aspects in the use of video display terminals." The availability of this information is announced by direct mailings to relevant organizations. Access to both the information and the information referral service could be improved by announcements in select trade and scientific media, and via the NIOSH Exhibits Program at convocations of the mental health community and other relevant professional, industry, and labor organizations.

The NIOSH Exhibits Program promotes safety and health awareness through displays at meetings of major professional and labor organizations (e.g., American Public Health Association, American Occupational Health Conference, National Safety Council, American Industrial Hygiene Association, American Nurses Association, AFL–CIO Industrial Union Department). This program could provide a vehicle for promotional activities on work and mental health issues. Extension of this exhibits program to key organizations concerned with mental health issues (e.g., the American Psychiatric Association, the Society for Behavioral Medicine, the American Sociological Association, Association of Labor–Management Administrators and Consultants on Alcoholism, and other relevant state, volunteer, and private organizations) may reap important benefits.

Information on occupational factors in mental health can be disseminated at the industry level through communications and newsletters of trade associations and through the internal health newsletters that some large corporations maintain for distribution to their own employees (e.g., the Kimberly–Clark Health Management Bulletin). Efforts of this type should be encouraged because of the job-specific nature of many risk factors.

The subject of psychological problems in relation to work can be incorporated into the agenda of regular safety committee meetings at the worker–management level by disseminating information on problems and controls through meeting notes and labor newsletters. In addition, telephone networks such as TEL-MED and HEALTH LINES that provide public access to prerecorded health information, could disseminate information on work and mental health issues at the level of the individual worker.

Mobilization and coordination of relevant organizations. Professional organizations concerned with mental health should dedicate additional effort and resources to the subject of work and mental health. For example, the American Psychological Association (APA) has no focal activity in this area. One positive step would be for organizations such as APA or the Human Factors Society to strengthen divisional or technical group activities in the area of work and mental health or to conduct focused symposia, paper sessions, or tutorials on this subject at their meetings. Equivalent activities focusing

on psychological health outcomes could also be cultivated within professional organizations (e.g., the American Management Association) to deal with the design of jobs and work environments.

Many federal agencies and national professional organizations (e.g., NIOSH, NIMH, National Institute of Drug Abuse, National Institute on Alcohol Abuse and Alcoholism, and APA) offer resources in terms of information, technical expertise, sponsorship of meetings, and so on, bearing on work and mental health. Yet, little formal interaction exists among these organizations. Coordination of efforts or development of a more formal network among these organizations could result in improved resources and resource availability in the area of work and mental health. NIOSH and CDC should take the lead and explore mechanisms and subjects of interaction among relevant federal, state, and professional organizations concerned with work and mental health issues. NIOSH should also initiate a conference for state health and mental health departments to discuss and develop action plans that implement the recommendations of this strategy.

Enriching Psychological Health Services for Workers

Although improved job design and organizational practices can lead to improved psychological well-being among workers, such steps alone cannot fully eliminate the problems. The workplace is a microcosm of the general community, and the stresses and psychological disorders manifest in the community at large are also felt in the workplace. Regardless of the etiology, these problems are borne by industry through absenteeism, turnover, accidents, slippages in productivity, and health benefits. Rohan (1982) has reported, for example, that a chemically addicted employee is 3.6 times as likely to be involved in an accident, has 2½ times as many absences lasting eight days or longer, receives 3 times the average level of sick benefits, and is 5 times as likely to file a claim for workers' compensation. It is not surprising, therefore, that industry has responded with increased mental-health-related services for employees. Although such services play a critical role in the prevention mix, further attention to both their design and availability is needed.

Worksite-Based Mental Health Services: The Status Quo

To date, workplace treatment of health problems that have psychological dimensions has been accomplished primarily through EAPs or through referral to community health agencies. Neale et al. (1983) observed that EAPs represent a step in the right direction but often suffer because they focus more on treatment than prevention and are aimed primarily at reducing personnel and productivity problems, alcoholism, and chemical dependency, especially among blue-collar employees.

In recent years, EAPs have multiplied exponentially among U.S. firms. Walsh and Hingson (1985) cited data from the National Institute on Alcohol Abuse and Alcoholism indicating that the number of EAPs had grown from 6 in 1945, to 500 in 1973, to 4,400 in 1979–1980. However, the Association of Labor and Management Administrators and Consultants on Alcoholism estimated that in 1980 only about 12% of the U.S. work force had access to such programs, and availability was restricted primarily to employees of larger organizations. Public employees particularly are slighted in this regard (Bezold et al., 1986).

Quite apart from EAPs, health awareness and health promotion programs are also increasing in prevalence in industry. In contrast to EAPs, these programs are aimed more at the prevention of illness through education and the advocation of good health practices. Techniques of health risk appraisal may be used to examine life-style risk factors that can result in morbidity or premature mortality. Risk reduction programs, such as nutrition workshops, exercise and fitness activities, smoking cessation clinics, and stress management courses are offered to effect needed changes. However, these programs have typically been aimed at the white-collar work force, have been episodic, and have failed to emphasize occupational factors. Systematic follow-up and evaluation are rare (Neale et al., 1983).

EAPs and health promotion programs appear to be progressing toward a more comprehensive approach to worker health in which prevention and treatment activities are integrated to promote overall well-being (George-Perry, 1988). It is projected that these programs may grow to encompass family and community issues and organizational issues such as management style and environmental policies (Bezold et al., 1986).

Thus, although there is a steady movement toward more and improved work-site health opportunities, existing programs clearly have limitations. Moreover, the vast proportion of workers in America still have no mental health services available through their employment.

Recommendations for Improving Worksite-Based Mental Health Services

Because of the current limitations in occupational health services, the following recommendations are offered to assure workplace psychological health services that are at least minimally sufficient.

1. Working through existing and new interagency agreements, NIOSH, the Alcohol, Drug Abuse, and Mental Health Administration, and state mental health agencies should support such activities as (a) demonstration grants for mental health programs in industry; (b) development of innovative approaches to mental health services in industry; (c) program evaluation research; (d) development of communication networks linking industry, providers, and resource organizations; (e) educational efforts such as symposia and workshops on work-site mental health programs; and (f) direct consultation with industry or trade associations, individual businesses, and labor organizations to promote establishment of high quality service programs for work-site psychological health in all

medium and large workplaces (e.g., in excess of 100 employees).

2. Mental health services should be integrated into the overall occupational health care program, whether on-site or external to the organization, and developed in a coordinated fashion with input from all relevant departments (e.g., medical, safety, personnel, risk management, line management). Key organizational characteristics of these services should include (a) joint management–worker input to program planning and administration; (b) ongoing services; (c) a formalized policy for referrals; (d) mechanisms for maintaining confidentiality of information; (e) guarantee of professional independence of providers; (f) specialized training to assure professional competence of staff; (g) access to these services through health benefit packages; and (h) access to the program by employees at all organizational levels.

The scope and content of psychological health programs should be adjusted according to local factors such as the nature of the work performed and special needs of the work force. All such programs should offer, at a minimum, basic psychological support in areas common to any work force such as personal crisis management, alcohol and chemical dependency, marital and family counseling, and stress management. These services should have both treatment and primary prevention components. More specialized concerns such as impending retirement, lay off, relocation, and other job-specific problems may require additional effort and expertise. Mechanisms should be established for input by consultants in occupational mental health. These programs could provide a rich source of data through periodic feedback to the organization in aggregate form (to protect confidentiality) to help identify or rectify organizational problems.

3. Within small firms in which the establishment of on-site programs for psychological health services may not be feasible, a liaison or network should be established with local mental health or social service agencies to provide a bridge between troubled workers and treatment facilities. Formalized relationships should be developed so that routine referral is possible and mental health personnel from the agencies can be enlisted readily for specialized programs. State or local mechanisms should be developed to assist small firms in seeking these appropriate mental health services.

4. Local mental health and social service agencies should develop internal staff competence or seek consultation from appropriately skilled professionals on occupational mental health issues.

5. Further broadening of services in occupational psychological health, along the lines described earlier, is needed for federal, state, and municipal public employees.

6. In line with increasing judicial recognition of the occupational components of disabling emotional disorders (DeCarlo, 1985), health insurance benefits for treatment of such problems should be expanded and increased.

7. EAPs and health promotion programs should evolve to a higher state of awareness and practice, recognizing both occupational and nonoccupational factors as influential to health, and offering opportunities for both organizational and individual interventions to improve employee mental health.

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