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PREDICTORS OF PSYCHOLOGICAL DISTRESS IN THE WORKPLACE:
A LONGITUDINAL STUDY

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ABSTRACT

This paper explores the impact of rapid work changes on the psychological well-being of hospital staff and examines predictors of later psychological distress. A 21% random sample of employees were surveyed in 1995 and in 1997 about their emotional functioning, coping resources, job characteristics, and the job-home interface. Psychological distress increased significantly over time. The variance in 1997 psychological distress scores could be explained by the initial level of psychological distress, job characteristics, particularly changes in them (28%), the job-family interface, particularly the extent to which the job interfered with home life and increasingly did so over time (8%). Negative changes in job characteristics and increasing impact of work on home life were most predictive of later psychological distress.

INTRODUCTION

Although reducing stress in the workplace and its manifestation in a range of psychological, behavioral and physical problems is seen as one of the challenges for the 1990s (Keita & Sauter, 1992), there is little agreement on how best to combat stress at work. Methods for dealing with work-related stress can be seen as falling into primary prevention (changing job design to improve the work environment), secondary prevention (attempting to enhance worker's stress tolerance and skills in coping with stress) and enrichment of health services to allow early access to treatment of affected workers (through Employee Assistance Programs or other schemes that provide expanded health insurance for mental health services). A recent focus has been to encourage the development of healthy work and work environments that support psychological and physical health.

Psychosocial risk factors associated with working conditions suggest that the amount of personal control over job demands may have important health consequences particularly when control is not commensurate with job demands, creating job strain (Karasek, 1979; Karasek & Theorell, 1990; Sauter, Hurrell & Cooper, 1989) and when social support from co-workers and supervisor are lacking (Ganster, Mayes & Fusilier, 1986; Kahn & Byosiere, 1992). Most of the research which supports the demand-control model has been done with blue-collar workers (Karasek & Theorell, 1990; Pieper, LaCroix & Karasek, 1989), often working in assembly-line settings. Here serious effects of jobs with high strain (high demand, low control) have been shown. Söderfeldt and colleagues (1996) have argued that this demand-control model may not fit human service organizations (HSO) well since here people rather than things are the raw material, the goals or products of the enterprise are less clear, the means to produce the desired effects are less obvious, and organizational effects may, among other things, make the goals of the HSO worker somewhat different from the clients' goals. They suggest that role ambiguity is likely to be much higher in HSO workers and a significant source of stress. Kahn and others (1964) earlier suggested role ambiguity as an important work stressor. Job insecurity, a factor on the rise in the last decade as workplaces downsize and reorganize, has also been seen as an important aspect of the work environment (Dekker & Schaufeli, 1995). It may affect worker well-being as it creates another type of uncertainty in the worker.

Self reports of psychological distress are also affected by variables other than perceptions of the work environment. Individual differences in personal factors such as the individual's feelings of self-esteem or self-efficacy, his/her home environment and the work load it generates (Gottlieb, Kelloway & Martin-Matthews, 1996; Kushnir &Kassan, (1992-3);

Schwartenberg & Dytell, 1996) and the worker's style of coping with stressful job situations (Latack, 1986) may also influence the amount of psychological distress expressed in relationship to work.

To date, more attention has been paid to development of health promotion programs in the workplace which attempt to teach strategies to workers aimed at helping them adjust better to their work environment than has been paid to job design (e.g. Martin, 1992; Murphy & Schoenborn, 1989; Murphy, 1996; Munz, Huelsman & Craft, 1995). Workers are taught to reduce the stress at work by changing their appraisal of situations and/or learning to cope more effectively. Exercise programs and time management seminars also are used to enhance workers' stress tolerance and coping strategies (Cartwright, Cooper & Murphy, 1995; Murphy, 1996).

People differ in their reactions to the same kind of work stressor. As Aneshenel and colleagues (1991) have shown, the effects of social factors on a specific psychological disorder such as depression cannot be equated with the overall impact of such a factor on mental health. Workers exhibit problems with work environment adjustment in different ways. Some workers may become anxious, others depressed, etc.. Thus, a composite measure which encompasses several psychological manifestations of stress is needed to measure the nonspecific, work-stressor impacts on the psychological well-being of workers.

In this paper, predictors of psychological distress are examined during a period of rapid change in the workplace. The staff of a large teaching hospital was studied while it sought to reorganize its programs and services to cope with a significant reduction in its operating budget due to fiscal constraints demanded by the provincial government. During the two years studied, about 9% was taken out of the operating budget. The nature and extent of the job changes made are described below.

In this paper we examine how well variables describing personal characteristics of the worker, their personal resources, initial psychological distress, and their job characteristics and changes in them over this two-year period explain the variance observed in their psychological well-being in 1997. A psychological distress score is constructed that captures change over time in anxiety, depression and emotional exhaustion. In particular, we examine how well the job demand-control model fits in this human services setting and the extent to which other factors in the work environment (job insecurity, role ambiguity) and changes in these factors are important. We also examine the importance of the work-home interface, particularly home life interference with work and work life interference at home, in explaining later psychological distress.

METHODS

This study, approved by the Ethics Review Committee of the Faculty of Health Sciences at McMaster University, involved surveys of a random sample of the hospital staff at three time periods.

Setting and Nature of Changes

A large Canadian teaching hospital was the setting for this study. The major changes that occurred during the study period and affected its workers are outlined in Figure 1. In the spring of 1995, when the study began, senior managers had begun to plan for re-engineering of services and care delivery processes.

In the subsequent year, many staff members became members of work redesign teams or contributed suggestions for redesign of care and services. Some changes began and the extent of change was becoming apparent. Voluntary severance packages and anticipated job losses were announced to the staff. "Roll out" of changes to major clinical areas began to occur early in the second year; inpatient areas underwent changes before outpatient areas. Some services were contracted-out while others were redefined. Several new job titles were introduced which involved employing less-skilled workers (environmental associate; clinical associate) to handle some tasks. Some cross-training of staff occurred to provide greater flexibility in service delivery.

By the time of the 1997 survey, redesigned services and care delivery processes had been implemented. During the previous year, many of the workers had reapplied to obtain "new" jobs, some of which were similar to previous positions. However, most jobs reflected a repackaging of work responsibilities and some job role change. Delayering of the organization had occurred as a program management structure was adopted. Workers who were unsuccessful in finding a "new" job had left the organization. As well, an administrative merger occurred with another hospital. Changes due to the merger, aside from changes in senior administration, had not been announced when the final survey was conducted. But, in restructuring of the hospital system provincially, hospital mergers at other locations had led to announcements of closure of some sites (or services); these developments were known to the staff.

During the two years covered by this study, the operating budget of the hospital had decreased by more than 9% ($13.5 million, Canadian). Additionally, the hospital absorbed $2.5 million in mandated salary increases.

Sample

A random sample of 900 employees was selected from the hospital's human resource files, representing approximately 21% of the work force. All staff members who were current employees in May, 1995, and working at the hospital (not on sick leave, educational leave or on extended disability benefits) were eligible to participate. This cohort was surveyed yearly. This report describes the experience of staff who remained with the organization and responded to the 1995 and 1997 surveys.

Questionnaire

The questionnaire used scales taken from the literature to measure key constructs of interest including workers' perceptions of their jobs, emotional well-being, personal coping resources, and the extent that their home life interfered with their job and the job got in the way of their home life. As well, information about their personal situation (age, sex, education, etc.) was obtained. (See independent variables and dependent variable descriptions below.)

Data Collection Procedures

Questionnaires were sent to the random sample of hospital staff in mid May of each year at their work address. A thank-you reminder post card followed 10-14 days later. Non-respondents received 2 subsequent mail-outs of the survey approximately 3 and 6 weeks after the initial mailing. Respondents had given permission to link their data across surveys.

Independent Variables

Job characteristics   Several measures were included to describe important dimensions of workers' jobs that could be affected by the changes and either have been seen to promote or detract from workers' well-being. (See the Appendix for a description of each measure.) We were interested in the extent to which workers felt a sense of control over their job and immediate job environment and saw their job roles as clearly defined. In Karasek's (1979) model, job strain is created when job demands are high but decision latitude is lower. The job strain variable was created by subtracting the decision latitude score from the job demand score for the time period. As well, social support in the workplace is seen as important to job quality and as a buffer to job strain. Teamwork, extent of role ambiguity and social support derived from both co-workers and supervisors (Ganster, Mayes & Fusilier, 1986), variables that have been seen cross-sectionally as important to the workers' well-being, were measured. The extent of job insecurity was also of interest as negative effects on well-being have been reported (Heaney, Israel & House, 1994; Ferrie, Shipley, Marmot, Stansfeld and Smith, 1995) and heightened job

insecurity has been reported among survivors of downsizing (e.g. Armstrong-Stassen, 1994). These variables were also used to create a variable reflecting change over time in the measure (by subtracting the 1995 value from the 1997 value). For example, change in job insecurity was defined as job insecurity score in 1995 subtracted from the 1997 job insecurity score. A positive score thus meant that the 1997 score was higher than in 1995.

Other types of variables   Personal resources, such as perceived job self-efficacy, readiness for organizational change and coping or problem-solving style used in job-related matters might lead to differences among people in reactions to the changes occurring and be protective of their well-being. (See Appendix.) Significant change was not expected and did not occur in these measures over time (Woodward, Shannon, Cunningham et.al., 1999). Thus, their change scores from 1995 to 1997 are not included in this analysis.

The proportion of female workers on the hospital staff is high. We were interested in the work-home interface. Particularly we wondered about the effects of the demands of both home and work roles, particularly the extent of interference between them created either by home demands or work demands. The measures chosen were used in the Whitehall II study (Marmot, Smith, Stansfeld et al, 1991). Change variables were computed for each of these work-home interface measures by subtracting the 1995 score from the 1997 score.

The questionnaire also gathered socio-demographic information (age, sex, education level) that was used in this analysis.

Dependent Variable

Three measures of psychological distress were chosen to examine how changes affected the workers' sense of well-being. A ten-item version of the State Anxiety Scale (Speilberger, Gorsuch & Lushene, 1970), the 7 item emotional exhaustion scale of the Maslach Burnout Inventory (Maslach & Jackson, 1981) and a ten-item version of the Center for the Epidemiological Study of Depression Scale (Radloff, 1977) (See Appendix). These variables, after being examined separately, were combined into a measure of psychological distress. Because the scales had different response formats, each variable was converted to a z score. To allow comparison of change across years, the 1995 mean score for each scale was used to compute the z score for that scale in 1997. We then added the three z scores for each year to create overall measures of emotional distress at each time.

Data Analysis

Using SPSS-PC, version 6.0, we summarized the data into scales, where appropriate. Descriptive analyses were done, using either frequency distributions or means and standard deviation. Each scale's summed score was divided by the number of items on a scale to return the scale to the original scoring for the scale's individual items. Change scores from 1995 to 1997 were calculated for scales related to job characteristics and personal impact measures. Effect sizes for significant changes are described using Cohen's d statistic (Cohen, 1977).

We then used the 1997 psychological distress score as the dependent variable in the regression equation and used a stepwise procedure to enter the independent variables in blocks. The initial psychological distress score was entered first. The three variables describing personal characteristics variables (age, sex and educational level) and the three personal resource variables (job self-efficacy, active coping style and readiness for change) were entered next. Only initial scores of these variables were used, as no significant change had been anticipated or was seen in them. The next step considered the eight initial job characteristics scores; changes in the scores for those eight variables were entered next. The usefulness of two work-home interface measures (family interference with job and job interference with family) and of their change over time was assessed by separately adding them as independent variables to the model.

The preferred approach in regression analyses is to base selection of variables for the model on some a priori theory. In this case, we knew that the strongest predictor of the dependent variable was likely to be its initial value and included this in the model. We were interested in which of the personal characteristics and job variables might be important additional predictors. Finally, we were interested in the role of work/home interface and changes in job interference with home life and home interference with work. With the initial psychological distress score included in the model as a predictor, the remaining independent variables could be considered correlates of change in the outcome. We anticipated that changes in (perceptions of) work conditions and the work/home interface variables would be more relevant than initial levels, although initial levels might be important in setting a limit on the amount of change that is possible. The partially exploratory nature of this report must be remembered in interpreting the results.

RESULTS

Response Rate

Of the 881 initially eligible workers, 74% of staff responded to the survey in 1995. By the time of the 1997 survey, only 730 (83%) in the sample were employed at the hospital. (See Woodward, Shannon, Cunningham et al, 1999.) This paper focuses on 52% of the staff who were eligible for the study (380/730) and responded both in 1995 and in 1997.

The Dependent Variable

Table 1 reports the 1995 and 1997 scores for the anxiety, depression and emotional exhaustion scales and for the composite psychological distress scale. Significant increases occurred in all of these measures between 1995 and 1997 (paired t-tests, all p values<0.001). The correlation among these measures in 1995 and in 1997 is reported in Table 2.

The Independent Variables

As reported in Table 3, the mean age of these workers in 1995 was about forty, 89% were women and they were well educated (three-quarters had a community college, university or advanced degree). As a group, they were people who had a reasonably proactive, problem-solving coping style, who felt reasonably confident in their abilities in the job market and were prepared to make some changes in their work. Workers averaged about 36 hours a week in job-related activities in 1995. Some job strain existed (jobs with demands greater than their decision latitude) already. Teamwork was good; support from co-workers and supervisors was also rated quite high. Job insecurity, while present, was not high on average. Job influence and role ambiguity were rated lowest. Jobs demands reduced time with family and for family matters that needed attention and job worries sometimes made the worker irritable at home. The job was seen as interfering with family life more often than family life was seen as affecting the job.

Between 1995 and 1997, as a group, these workers reported that job strain, role ambiguity and job insecurity increased. Perceived supervisor and co-worker support decreased along with teamwork. The time spent on job-related activities increased almost two hours. All of these job changes were statistically significant changes (paired t-tests, p<0.001). However, little change was noted in job influence. Both job interference with family life (paired t=5.2, p<0.001) and family interference with work (paired t= 3.4; p=0.001) increased over time. Workers reported a greater increase in the interference of their jobs with family life than the family with work life.

Regression Analyses

Table 4 shows that, as expected, initial level of psychological distress predicted psychological distress in 1997, accounting for about 34% of the variance. Socio-demographic characteristics (.1%) and personal resource variables (1.8%) contributed little to prediction. Initial job characteristics explained an additional 3.2% of the variance, with greater role ambiguity and lower job strain in 1995 the most important of these. Change in job variables were very important predictors, accounting for an additional 24% of the variance. Particularly, decreased co-worker support and increased job strain, role ambiguity and job insecurity, were significant predictors of greater psychological distress in 1997.

The contribution of home-work interface measures taken in 1995 added slightly to psychological distress by 1997, accounting for .9% of the variance. Again changes in work-home interface measures (7.1%), particularly increasing interference of the job with family life, appear to be more explanatory than 1995 levels and related to increased psychological distress.

DISCUSSION

Several important findings emerge from these analyses. First, there was a significant increase in psychological distress in the workers who remained with the organization during the two-year period studied, while rapid change occurred in the workplace. Socio-demographic characteristics and personal resources of the workers contributed little to explaining increased psychological distress. Rather job characteristics, particularly changes for the worse in job characteristics, were important predictors of the change. Changes in job and work-family interface measures were more important than 1995 levels of these variables.

These findings raise some questions about the nature of the "survivors' syndrome" noted by several authors. Some have assumed that workplace survivors' distress is created in large part by seeing their colleagues leave, feeling bad about the processes by which these decisions were made and about being the worker who remains employed as well as some concern about their own job future (e.g., Schoenberg, 1995; Noer, 1998). Although low co-worker support (e.g.,Wilkins and Beaudet, 1998) or decreased co-worker support (through co-workers leaving and/or the worker or his/her former co-workers moving to other job areas), as seen in this study, are linked to increased psychological distress, the psychological distress experienced by workers who remain after downsizing is also likely to be a function of changes in their jobs, which have often been redesigned and made more stressful as part of the downsizing exercise. Our results suggest that role ambiguity, job strain, job insecurity, which increased during the downsizing period, are major contributors to these "surviving" workers' psychological distress. Marek (1992) also noted an increase in anxiety among workers after downsizing that he attributed to employees being given unfamiliar jobs and tasks that may create a heightened fear of creating errors and possibly being let go because of them.

The extent to which the job interfered with family life and increasing interference of job with the family were very important predictors of subsequent psychological distress, accounting for an additional 8% of the explained variance in psychological distress. Job interference with home life may be a consequence of psychological distress related to job changes such as increasing role ambiguity, job strain and job hours. Our data suggest that when a job reduces the time spent with family members, (the average worker worked about two hours longer in 1997) increases worker irritability at home and depletes workers' energy so that they cannot carry out tasks requiring their attention at home, this situation now also directly contributes to increasing psychological distress. Although the proportion of women studied is high, the converse- family demands interfering with work- was not an important direct predictor of increased emotional

distress. A recent article (Schiff, 1997) suggests that difficulty balancing work and family demands is the most frequently cited cause of workplace stress with men and women equally likely to say that they sometimes neglect their families because of work pressures. Downsizing is cited as helping make job workloads "virtually anti-family"(p.46). Better information is needed about the consequences of job design on workers' ability to receive support from and meet their obligations to their families. Both the sources and direction of work-family conflict should be measured in studies of work and health (Gottlieb, Kelloway & Matrin-Matthews, 1996; Jex, 1998).

The effect of job insecurity on health outcomes has been noted previously (e.g. Dekker & Schaufeli, 1995; Ferrie, Shipley, Marmot, et al, 1995 and 1998, Wilkins & Beaudet, 1998). Our study suggests that not only levels of job insecurity measured at a point in time are predictive of later psychological distress; job insecurity increases are accompanied by increasing psychological distress with time.

Feeling ready to participate in change, perceiving that they have good job skills that are readily transferrable to other settings was associated with somewhat less distress but explained little of the variance. Having an active, problem-solving approach to coping with their jobs was positively related to psychological distress and did not protect these workers from increasing emotional distress. This suggests that during periods of rapid workplace change, such positive coping strategies may not be protective; the pace of the change may make them less effective. This idea is speculative and must be examined in organizations which are and are not undergoing major, rapid changes. However, previous studies (Menaghan & Merves, 1984, Latack, 1986) suggest that a positive thinking, direct action and information seeking style of coping at work is associated with less psychological distress. Noer (1998) also suggests that individuals who maintain a sense of internal control, believe in their own abilities and are self-reliant, should fare better emotionally after downsizing. Our data do not support this contention.

Few studies have been able to include changes in measures over time. In our study, such changes were important predictors of psychological distress and were more explanatory than initial scores on job measures. This suggests that changes in job characteristics, not simply the characteristics of a job at a given point in time, may be important to ascertain in longitudinal studies of the impacts of jobs on health and well-being of workers.

While the longitudinal nature of this study may be seen as one of its major strengths, it also suffers from some of the problems associated with longitudinal studies. Attrition from the

study occurred over time and only 52% of the workers who were sampled and remained with the organization for the two years responded in both 1995 and 1997. Further, although sex of the participant was not important to the outcomes observed, men were less likely to participate in the study and their low participation rate may have precluded seeing such associations (Woodward, Shannon and Cunningham et al, 1999). Finally, both the independent and dependent variables were assessed by self-report (Spector, 1994). Both may have been influenced by negative affectivity, leading to spurious results (Watson & Clark, 1984). The longitudinal nature of the study may have lessened this problem to some extent, especially as the change scores, rather than the initial values, of variables were most predictive.

Karasek's job-strain model (1979) was predictive of psychological distress among these hospital workers, particularly increasing job strain among those who had had jobs that created little strain. Role ambiguity, identified by Söderfeldt and colleagues (1996) as possibly important in human service organizations, was not high among these hospital workers at the beginning of this study. However, role ambiguity increased markedly and this change was linked to psychological distress. Previous meta analysis of correlation studies have also reported a link between role ambiguity and psychological distress (Fisher & Gitelson, 1983; Jackson & Schuler, 1985). Role ambiguity has also been linked with poorer job performance in several meta analyses (Tubre, 1996; Abrams, 1994). As pointed out by Jex (1998) although most ratings of job performance in these studies were made by the employees themselves and thus is subject to methodologic biases, the perception that their performance is lacking may itself have negative job implications. The increasing role ambiguity observed may reflect the fact that these workers were still learning their new job roles. In this case, role ambiguity levels may eventually fall.

CONCLUSIONS

Many of the antecedents of psychological distress among the hospital workers studied related to their jobs and changes in them. However, jobs that interfered with workers' role in their families and increased interference with family life over time, were significant independent predictors of psychological distress. Future studies of work and health should consider focus not only on job design variables but also how jobs affect the workers' family responsibilities as this also contributes directly to psychological distress.

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APPENDIX

Description of variables used in this analysis.

Job Characteristics:

Job Influence. This ten item scale captures the amount of influence that employees feel they have over a wide range of job-related dimensions, very little (1) to very much (5) on a 5 point scale. (Greenberger, 1982).

The following four measures were adapted from Karasek (1985) and used a 5 point Likert-type, strongly disagree (1) to strongly agree (5) response format.

Decision Latitude. This nine item scale asks respondents to comment on the extent to which their job gives them discretion or decision-making authority.

Co-worker Support. This seven item scale reflects the extent to which co-workers are seen as competent, understanding and supportive of the employee.

Supervisor Support. This three item scale asks respondents about whether their supervisor is helpful, concerned about the welfare of employees and is able to facilitate effective interaction among employees.

Job Demands. This six item scale reflects the psychological and physical demands of one's work.

Role Ambiguity. This four item scale with five responses (1=never to 5= always) categories was developed by Brosnan and Johnson (1980) to examine the extent to which job responsibilities and expectations are unclear and there is difficulty with conflicting priorities and job demands.

Teamwork. A six item scale about the extent to which one's work unit coordinates efforts, solves problems and works effectively together (1=to a very little extent to 5=to a very great extent) taken from Taylor & Bowers, 1972.

Job Insecurity. A six item scale that reflects employees' confidence in the security of their job (1=strongly agree to 5=strongly disagree) developed by Greenberger & Rosenblatt (1984).

Personal Resource Measures:

Self efficacy. A new five item measure of confidence in the competitiveness and transferability of one's skills, job prospects, and ability to cope with job change, measured with a 5 point agreement scale (5 is high agreement).

Readiness for Organizational Change. A six item adaptation of the concepts involved in the readiness for change scales developed by Prochaska and colleagues (1994) using 5 point agreement scale (5 is high agreement).

Active Coping Style. A five item measure of an active problem solving style regarding work issues (1=never to 5=almost all of the time) adapted from Israel and colleagues' (1986) study.

Personal Impact Measures:

Both scales use a three point (1=not at all to 3= a great deal) response format and used in the Whitehall II study (Marmot, Smith, Stansfeld S, et al, 1991).

Family Interference. The four item scale (alpha =.77) reflects the potentially adverse effects of family demands on work performance including reduced time to devote to job and personal matters and lowered job performance due to lack of sleep or family worries.

Job Interference. The three item scale (alpha =.64) measures the adverse effects of job on family life (increased irritability, reduced family time, and less energy for doing things at home). One item was dropped from the original scale as hospital workers did not travel extensively for their jobs.

Scales contributing to the Composite Measure of Psychological Distress:

State Anxiety. A ten item version of the State Anxiety Scale (Speilberger, Gorsuch & Lushene (1970) which asks how much anxiety (as reflected in feeling jittery, nervous, rattled, etc.) the person experiences now (1=not at all to 4=very much so).

Emotional Exhaustion. The seven item emotional exhaustion scale of the Maslach Burnout Inventory (Maslach & Jackson, 1981) measured using a seven point frequency scale (0=never to 6=every day).

Depression. A ten item version of the Center for the Epidemiological Study of Depression Scale (Radloff, 1977) which is used to measure depression in the general population using 4 point frequency scale (1=rarely or none of the time to 4=mostly all of the time).

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