Stress Management

The Relationship Between Hardiness, Supervisor Support, Group Cohesion, and Job Stress as Predictors of Job Satisfaction

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Abstract

Purpose. This study tested a conceptual model based on research supporting the relationship between the predictors of hardiness, supervisor support, and group cohesion and the criterion of job stress and job satisfaction and between the predictor of job stress and the criterion of job satisfaction.

Design. The study employed a cross-sectional research design. Survey data were collected as part of the baseline measures assessed prior to an organizational hardiness intervention.

Setting. Worksite of Dell Computer Corporation in Austin, Texas.

Subjects. The subjects included 160 full-time Dell employees recruited from a convenience sample representing nine work groups (response rate = 90%).

Measures. Hardiness was measured using the Dispositional Resilience Scale (DRS), job stress was measured using the Perceived Work Stress Scale (PWSS), and supervisor support, group cohesion, and job satisfaction were measured using a proprietary employee attitude survey.

Results. In the proposed model, high hardiness, supervisor support, and group cohesion were related to lower levels of job stress, which in turn was related to higher levels of job satisfaction. The model also proposed direct paths from hardiness, supervisor support, and group cohesion to job satisfaction. Path analysis was used to examine the goodness of fit of the model. The proposed model was a good fit for the data ($\chi^2[11, N = 160] = 1.85, p = .174$) with the exception of the direct path between group cohesion and job satisfaction. Substantial portions of the variances in job stress ($R^2 = .19$) and job satisfaction ($R^2 = .44$) were accounted for by the predictors.

Conclusion. Implications for targeted worksite health promotion efforts to lower job stress and enhance job satisfaction are discussed. (Am J Health Promot 2003;17(6):382-389)

Key Words: Hardiness, Supervisor Support, Group Cohesion, Job Stress, Job Satisfaction, Prevention Research

INTRODUCTION

Job satisfaction has been a valued topic of research in such disciplines as organizational psychology, social psychology, and business management for several decades. The concept of job satisfaction is a desired outcome of interest to many researchers because of its intrinsic value as an end in itself. Job satisfaction is also valued as a means to various ends or outcomes. For instance, job satisfaction has been shown to impact a variety of work-related outcomes such as organizational commitment, absenteeism, turnover, and turnover intentions. In addition, job satisfaction has been related in a broader sense to quality of life and life satisfaction. The inherent value of job satisfaction as well as the potential impact it can have on work-related outcomes and the well-being of employees make determining factors that contribute to job satisfaction of practical importance.

Job satisfaction is defined as a pleasurable or positive emotional state resulting from the appraisal of one's job experiences as fulfilling important job values. One of the most commonly cited predictors of job satisfaction is job stress. This relationship is consistent whether job stress is measured as overall perceptions of job stress, indicators of job stress such as job tension, emotional exhaustion, depersonalization, and poor personal accomplishment, or specific sources of job stress such as role ambiguity and role conflict. Job satisfaction has also been
shown to be influenced by psychological hardness as well as by interpersonal relationships in the workplace. In addition, job stress has been associated with psychological hardness and interpersonal relationships in the workplace. This study sought to replicate the relationship between job stress and job satisfaction and examine the extent to which psychological hardness and interpersonal relationships in the workplace relate to each.

**Hardiness**

Hardiness is a personality disposition that seems particularly relevant to job stress and job satisfaction due to its conceptual derivation from studies of employees in the organization. Kobasa advanced the notion of psychological hardness in an effort to explain why some employees experience debilitating illness during stress while others do not. Kobasa identified three general personality characteristics of those employees who did not become ill during stress and thus defined hardness as a "constellation of personality characteristics that function as a resistance resource in the encounter with stressful life events." These three basic elements comprising hardness include challenge, which is the perception of change as normal and natural, as well as an opportunity for personal growth; commitment, which is a sense of purpose or meaningfulness in one's life and a strong involvement in directing one's life course; and control, which is the belief that one is capable of impacting one's circumstances.

The focus of most of the hardiness research has been in the fairly global context of stressful life events and symptomatology. In the specific domain of the work environment, research has demonstrated that hardness is inversely related to overall perceptions of job stress, indicators of job stress such as emotional exhaustion, depersonalization, and poor personal accomplishment, as well as specific sources of job stress such as work pressure, role conflict, role overload, role ambiguity, and organizational climate and structure. Research examining hardiness in relation to job satisfaction has found it to be directly related as well as indirectly related through job stress. As this research suggests, individuals with high levels of hardness have higher levels of job satisfaction in part due to decreased perceptions of job stress but also as a function of their tendency to perceive change as a challenge, find meaning in and be committed to their work, and have an internal locus of control.

**Interpersonal Relationships in the Workplace**

The significance of studying interactions between supervisors and workers and relationships among coworkers is reflected by the increasing reliance on team-based work groups in organizations. In the current study, supervisor support is a marker for the interactions between supervisors and workers, and group cohesion serves as an indicator of the relationships among coworkers.

**Supervisor Support**

The support a supervisor provides to his or her coworkers has been studied in relation to a number of work-related outcomes, including job stress and job satisfaction. A great deal of attention has been directed toward supervisor support and the role it plays as a coping resource, assisting employees in coping with work-related stress. Supervisor support has been shown to relate to the experience of less job stress. This finding has been demonstrated with overall perceptions of job stress, as indicators of job stress such as emotional exhaustion and poor personal accomplishment, as well as specific sources of job stress such as role ambiguity, role conflict, role overload, and future uncertainty.

Supervisor support has also been associated with job satisfaction, whereby higher levels of supervisor support are related to higher levels of job satisfaction. There is also support for the indirect effect of supervisor support on job satisfaction through job stress. The research suggests that supervisor support influences job satisfaction by reducing job stress, but it may also influence job satisfaction directly by leading to more positive appraisals of one's work environment.

**Group Cohesion**

The concept of group cohesion has been conceptualized and operationalized in a variety of ways, leading to difficulty in comparing findings across studies. For this reason, critics have strongly emphasized the need for consistent conceptualization and uniform measurement of group cohesion. An appropriate definition that researchers and critics alike have suggested is "a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives." This definition emphasizes how integrated the group is with respect to achieving the group task and provides a precise conceptualization of group cohesion. Group cohesion has been negatively related to indicators of job stress such as vocational strain and specific sources of job stress such as role stress and role ambiguity. Group cohesion has also been related to greater job satisfaction. A possible explanation for this relationship is that cohesiveness implies satisfaction with one aspect of the job, the group, and it is more likely that job satisfaction will be greater for those who are satisfied with their groups.

The review of the literature above is supportive of several relationships. The inverse relationship between job stress and job satisfaction is well-documented in the research. The personality disposition of hardness and interpersonal relationship variables of supervisor support and group cohesion are all inversely related to job stress and positively related to job satisfaction. While the combined research discussed above supports these relationships, no one study has tested this exact configuration of variables. The purpose of this study was to test a conceptual model that represents these relationships using path analysis and thus extend the earlier research in this area. Path analysis enables tests of direct effects of the predictor variables (i.e., hardness, supervisor support, and group cohesion) on job stress and job satisfaction, the direct effect of job stress on
job satisfaction, as well as indirect effects of the predictor variables on job satisfaction through job stress. In addition, path analysis takes into account the intercorrelations among hardness and the interpersonal relationship predictor variables in determining the unique contribution of each to the organizational outcomes of job stress and job satisfaction.

From an applied standpoint, demonstrating these unique contributions would have important implications for approaches used in worksite health promotion programs that target job stress and job satisfaction.

METHODS

Design
The study involved a cross-sectional research design using survey data collected as part of the baseline measures assessed prior to an organizational hardness intervention. Corporate employees completed a questionnaire in small groups of approximately 15–20 individuals in quiet classroom conditions at their worksite. Study procedures were approved by the Institutional Review Board at the University of Texas at Austin, and data were collected and recorded so as to protect the confidentiality of participants.

Sample
The overall subject pool consisted of a convenience sample of full-time employees of Dell Computer Corporation in Austin, Texas, representing nine work groups from human resources, worldwide operations, finance, technical support, and a product group (N = 178). Of the employees surveyed, 160 responded, resulting in a response rate of 90%. The sample comprised of 52.8% males and 47.2% females with a mean age of 36.3 ± 8.1 years. The sample consisted of 80.8% white, 9.6% Hispanic, 5.1% African American, 3.2% Asian, and 1.3% identified as other. Of the employees, 75.9% were classified as exempt (salaried) and 24.1% were classified as nonexempt (hourly). All subjects were assured that their decision regarding whether or not to participate would have no effect on their relationship with Dell or the University of Texas at Austin.

Measures

Hardiness. Hardiness was defined as a personality disposition describing an individual with three closely related tendencies: perceiving change as a challenge, commitment to the people and activities in which they are involved, and a sense of personal control in handling life events. The 30-item Dispositional Resilience Scale (DRS) was selected as a measure of hardness because it assesses the presence of each of these tendencies. Respondents were asked to indicate the extent to which statements on the DRS were true in general on a Likert scale ranging from “not at all true” (0) to “completely true” (3). The DRS was found to have adequate internal consistency (α = .75).

Two important considerations in hardness research were addressed by using the DRS. First, older hardness scales have a propensity to tap negative affectivity because they assess hardness using negative item indicators. Use of the DRS implies some control for negative affectivity in that it has corrected for the exclusive use of negative item indicators while remaining correlated with the original hardness scale. Second is the issue of whether to treat hardness as a unitary construct whereby the three components are presupposed to interact with each other producing a unique effect on the dependent variable, which is different from the separate effects of the three subconcepts. The specific interest of this study was to examine hardness as it was originally conceptualized—as a unitary construct with synergistic effects on job stress and job satisfaction.

Supervisor Support. Supervisor support was defined as employees’ perceptions of the quality of their immediate managers’ supportiveness. The concept was assessed using three items from a proprietary employee attitude survey administered annually that focused on perceptions of managers being approachable, treating employees with respect, and being helpful with work-related issues. Respondents were asked to indicate the extent to which they agreed with such statements as “I feel free to ask my immediate manager for help when I need it,” on a Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5). The supervisor support scale was found to be internally consistent (α = .86).

Group Cohesion. Group cohesion was defined as employees’ perceptions of integrated behavior that is focused on achieving group goals. The concept was measured using two items from the proprietary employee attitude survey that assessed employees’ perceptions of the cooperativeness among coworkers, particularly how well employees worked together as a team. Respondents were asked to indicate the extent to which they agreed with such statements as “My coworkers cooperate with one another to get the work done” on a Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5). The group cohesion scale was found to have adequate internal consistency (α = .73).

Job Stress. Job stress was defined as employees’ perceptions of stress at work during the previous month with respect to irritating hassles, stressful events, and ongoing problems. The concept was measured using the seven-item Perceived Work Stress Scale (PWSS) developed by Mackie et al. This measure takes into account overall stress that can result from a variety of work-related stressors, i.e., a measure of experienced work-related stress rather than stressful work characteristics. Subjects were asked to respond to such items as “In the last month, how often have you had to deal with irritating hassles at work?” on a Likert scale ranging from “never” (1) to “very often” (5). The PWSS was found to be internally consistent (α = .88).

Job Satisfaction. Job satisfaction was defined as a pleasurable or positive emotional state resulting from the appraisal of one’s job experiences as fulfilling important job values. The concept was measured using four
items from the proprietary employee attitude survey that assess how good employees feel about what they do each day. Respondents were asked to indicate the extent to which they agreed with such statements as “I like my job” on a Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5). The job satisfaction scale was found to have adequate internal consistency (α = .72).

**Analyses**

Descriptive statistics including means and standard deviations were calculated for all variables. In addition, Pearson product-moment correlation coefficients were calculated to examine the linear relationships among all variables. A path analysis was conducted to test the goodness of fit of the proposed model depicting the relationship of the predictors including hardness, supervisor support, and group cohesion to job stress and job satisfaction and the predictor of job stress to job satisfaction. Goodness-of-fit indices were examined using the chi-square test, the normed fit index (NFI), the comparative fit index (CFI), and the Tucker-Lewis index (TLI). The chi-square statistic provides a test of the null hypothesis that the reproduced covariance matrix has the specified model structure (i.e., that the model fits the data). The NFI ranges from 0 to 1, where 0 represents the goodness of fit associated with a null model (one specifying that all the variables are uncorrelated) and 1 represents the goodness of fit associated with a saturated model (a model with 0 degrees of freedom that perfectly reproduces the original covariance matrix). The CFI and TLI are similar to the NFI. Values of over .95 on the NFI, CFI, and TLI indicate a good fit between model and data.\(^{50}\)

**RESULTS**

The possible range of scores, means, and standard deviations for all variables are shown in Table 1. Pearson product-moment correlations among the variables are also shown in Table 1. As expected, higher scores on hardness, supervisor support, and group cohesion and lower scores on job stress were significantly related to higher scores on job satisfaction. Also as expected, lower scores on hardness, supervisor support, and group cohesion were significantly related to higher scores on job stress.

Because each predictor variable (hardness, supervisor support, group cohesion) had a proposed path to each criterion variable (job stress, job satisfaction), the initial model was a saturated model. While a chi-square analysis cannot be computed with saturated models, the critical ratios of each proposed path can be. All of the critical ratios of the proposed paths were significant (above 2.0) except for the direct path from group cohesion to job satisfaction. Therefore, this path was dropped and the model was analyzed again. This time, the model was not saturated and a chi-square analysis could be computed. Results of this path analysis supported the final model as presented in Figure 1. Estimation of the model suggested it fit the data well, as indicated by the nonsignificant chi-square value, \(\chi^2(1, N = 160) = 1.85, p = .174\). The predictors accounted for substantial portions of the variances in job stress (\(R^2 = .19\)) and job satisfaction (\(R^2 = .44\)). All values of the descriptive goodness-of-fit tests exceeded .95 (NFI = .999, CFI = 1.0, TLI = .996), also indicating a very good fit between the final model and the data. All of the critical ratios of the proposed paths in the final model appear in Table 2, and all exceed a value of 2.0.

**DISCUSSION**

This study examined the relationship between hardness, supervisor support, and group cohesion as predictors of job stress and job satisfaction as well as job stress as a predictor of job satisfaction. It was expected that psychological hardness and interpersonal relationships measured as supervisor support and group cohesion would be negatively related to job stress and positively related to job satisfaction. It was also expected that job stress would be negatively related to job satisfaction. Correlational and path analyses supported all of the proposed relationships with the exception of the direct path from group cohesion to job satisfaction.

The correlational results of the study support the relationships depicted in the literature. The well-documented inverse relationship between overall perceptions of job stress and job satisfaction was supported.\(^{14,15}\) Consistent with the research literature, hardness was found to be inversely related to overall perceptions of job stress\(^{12,22}\) and positively related to job satisfaction.\(^{15,20,25}\) The inverse correlation
between supervisor support with overall perceptions of job stress was also supported. Additionally, an inverse correlation between group cohesion with overall perceptions of job stress was found, where previously only relationships to indicators of job stress and specific sources of job stress have been assessed. Finally, as expected, supervisor support and group cohesion were both positively related to job satisfaction.

The path analysis results correlated the correlational results with one exception, the direct path from group cohesion to job satisfaction was nonsignificant. The nonsignificant path between group cohesion and job satisfaction is inconsistent with previous research that has found group cohesion and job satisfaction to be related. This discrepancy may be accounted for by the manner in which group cohesion was operationalized. Previous research used instruments that primarily assessed group cohesion as interpersonal attraction within the group. In a review of cohesiveness research and measures, Mudrack suggested that the field move beyond conceptualizing cohesiveness in terms of attraction to a group and move toward conceptualizing as group task commitment to better establish associations with behavioral outcomes such as productivity. The group cohesiveness measure in the present study was based on Mudrack’s critique and measured commitment to the group task. Thus, the conflicting results obtained with the different measures suggest that the way in which group cohesion is measured may determine whether a relationship to job satisfaction is found. When group cohesion is defined as interpersonal attraction within the group, the construct is more likely to be related to subjective outcomes such as job satisfaction rather than to behavioral outcomes. When group cohesion is defined as commitment to the group task, the construct is likely to be related to behavioral outcomes such as productivity.

It is meaningful to note that this study assessed overall perceptions of job stress rather than specific indicators of job stress such as emotional exhaustion or specific sources of job stress such as role conflict. General measures of perceived stress such as the Perceived Work Stress Scale are based on the assumption that the individual’s perceptions of the stressfulness of “objective” stressors determines to some extent the impact those stressors will have. This has two implications for the interpretation of the findings associated with this measure. First, the overall perception of stress at work is cumulative in that it takes into account stress that may have resulted from any number of work-related stressors. Second, this measure of perceived job stress captures individual differences in the degree to which people may experience the same work-related stressors as more or less stressful. Exposure to objective job stressors in an individual’s life is not necessarily indicative of the subjective level of stress the individual experiences as a result.

Interestingly, high hardness, supervisor support, and group cohesion each had a similar significant relationship to perceived job stress. It makes sense that high-hardy individuals who see change as a challenge, commit to strong involvement in life, and believe in their capability to impact their own circumstances would perceive objective job stressors as less stressful than low-hardy individuals.
Given that supervisors are often in a position to directly impact specific job stressors, it follows that employees who view their supervisors as supportive would feel that they have more resources to help with those stressors. Resources to help meet the demands of job stressors also result from the cohesiveness one feels in working with coworkers who are focused together on achieving group goals in a cooperative manner. Perceiving that resources in the work environment are available for coping with job stressors offsets the balance between demands and resources in favor of less job stress.

The relationships between the predictor variables of hardness, supervisor support, and group cohesion to job stress can be interpreted from two different perspectives. The first is a stress-management perspective that the predictor variables can lessen the negative impact of already occurring stress by providing resources to manage the stress. From this stress-management perspective, hardness enhances one’s coping ability, and supervisor support and group cohesion provide workplace support to better manage the stress. The second is a stress-prevention perspective that the predictor variables can serve a protective function in the event of stressors that lessen the degree to which the stressor is perceived as stressful. From this stress-prevention perspective, hardness, supervisor support, and group cohesion provide the individual with resources before the onset of stressors that ultimately lessen their overall perceptions of job stress. Perceptions of job stress result from the individual’s appraisal of the balance between work environment demands and organizational/individual resources. If the appraisal of demands outweighs that of resources, the result is perceived stress. If the appraisal of resources outweighs that of demands, the individual feels equipped to handle the stressor and perceives less stress as a result.

Several predictors of job satisfaction were proposed in the conceptual model in this study. Hardiness, supervisor support, and job stress were found to be directly related to job satisfaction. In addition, hardness, supervisor support, and group cohesion were indirectly related to job satisfaction through job stress. Some research has suggested that these predictors may be positively related to job satisfaction by serving as a buffer from the negative effects of job stress.14, 29 This stress-buffering hypothesis was tested in the present study using path analysis and revealed no significant interaction effects of the predictors and level of job stress. In addition, the amount of variance accounted for in job satisfaction by including the additional cross-product terms did not increase. Therefore, it can be concluded that hardness and supervisor support were positively related to job satisfaction regardless of the level of job stress.

It makes sense that hardness would be related to job satisfaction in that an individual’s tendency to perceive challenge, commitment, and control in his/her work influences his/her attitudes toward work. High-hardy individuals tend to appraise change as an opportunity for growth and therefore the potential for one’s job experiences to be fulfilling is enhanced. High-hardy individuals also tend to have a strong sense of purpose in and commitment to the activities in their lives and therefore are more likely to be involved in jobs that are meaningful to them. It is characteristic of high-hardy individuals to believe they have the ability to impact their life circumstances, including those related to their jobs. This internal locus of control in the workplace is likely to foster a feeling of satisfaction with one’s job. It also seems logical that perceptions of the supportiveness of supervisors would be related to positive appraisals of the work environment and thus increased job satisfaction. Work environments in which supervisors are perceived as supportive will have more satisfied workers than those with less supportive supervisors.

Determining the factors that contribute to job satisfaction is of practical importance due to the impact job satisfaction can have on work-related outcomes and the well-being of employees in both work and general life domains. Employee job satisfaction may produce reactions that are beneficial to the achievement of organizational goals, such as increasing organizational commitment and decreasing absenteeism, turnover intentions, and turnover.16, 27 Job satisfaction may also have a broader reaching impact by enhancing quality of life and having a “spillover” effect of increasing satisfaction with other life domains.10, 21 As well as being a means to these various organizational and personal ends, job satisfaction has inherent value as a desired end in itself. Thus, efforts to promote the enhancement of job satisfaction can have a beneficial impact at both the organizational and individual levels.

Although causality cannot be determined in this study, relationships between the predictor and criterion variables have been demonstrated. Based on these significant relationships, several practical implications for intervening at the worksite to lessen job stress and enhance job satisfaction can be inferred. First, in an environment of increased uncertainty and rapid change, organizations may benefit by considering the inclusion of hardness concepts in training and assimilation programs to help prepare employees to deal successfully with change and job stressors as well as maintain a sense of satisfaction with their jobs. Second, because supervisors can act as a primary source of support at work and are often in a position to be proactive about the source of the stress, it may be advantageous for organizations to focus on training programs for supervisors that enhance managerial competencies and sensitivity to employees’ work-related support needs. Simultaneous employee development interventions that encourage employees to talk to their supervisors about work-related events that they perceive as stressful may also be helpful. Given that supervisor support is a strong predictor of employee job satisfaction, these simultaneous interventions to strengthen employee-supervisor relations may also enhance job satisfaction. Third, organizations may
benefit by considering the effectiveness of work culture assimilation and new employee orientation programs in establishing cohesive work groups. Efforts to develop and maintain intact work groups with clear goals and a unified purpose may help minimize stress in the changing work environment.

As highlighted in the text *Health Promotion in the Workplace,* organizations that seek to not only reduce costs but also improve organizational health and increase productivity should complement their traditional stress-management approach with a more proactive stress-prevention approach to stress programming. Traditionally, programs targeting job stress in the workplace intervene at the individual level to provide the employee with coping skills with which to deal with job stress and, less frequently, at the organizational level to modify or eliminate the sources of stress in the work environment. The underlying premise of this reactive stress-management approach is that the negative impact of already occurring job stressors on the individual can be lessened by intervening at these two levels. Stress-prevention approaches are more proactive in that they shift the focus to providing protective resources at the individual and organizational levels to lessen the degree to which objective job stressors are perceived as stressful in addition to eliminating organizational sources of stress when possible.

As noted previously, the relationships between the predictor variables and job stress can be interpreted from both these stress-management and stress-prevention perspectives. By focusing health promotion efforts on enhancing hardness, supervisor support, and group cohesion, it is likely that individuals will be enabled to manage current levels of stress as well as prevent further perceptions of stress. Therefore, it is possible for such worksite health promotion interventions to achieve both stress-management and stress-prevention goals. To do so, it is important that these interventions specifically address how one would utilize these same resources (i.e., hardness, supervisor support, group cohesion) to react to already occurring stressful situations as well as be proactive in lessening the degree to which future stressors are perceived as stressful.

The results of the study should be considered in light of several limitations that lend themselves to suggestions for future research. First, the self-reporting that was necessary to collect this survey data has inherent limitations. Even though the instruments used in the present study possess adequate psychometric properties, future research should include more objective measures of workplace variables such as the occurrence of specific job stressors and observations of supportive supervisory behavior to help compensate for the limits of self-report. Second, the use of a convenience sample of corporate employees limits the generalizability of the findings. Further research is necessary using populations that are randomly sampled, demographically diverse, and representative of other job types and work settings to strengthen the validity of the study findings. Finally, the design of the study is cross-sectional. Therefore, the possibility that a third variable may be accounting for some of the effects cannot be dismissed and causation cannot be determined. A potential third variable that may be important to include in future research due to its potentially confounding effects is negative affect. Including measurement of this or other relevant variables that may account for some of the observed effects will help to elucidate the exact nature of the relationships depicted in this study. The use of a prospective study design in future research would enable examination of the temporal relationships among the variables necessary to determine causation as well as the effects of targeted interventions on perceived job stress and job satisfaction.

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**SO WHAT? Implications for Health Promotion Practitioners and Researchers**

The results of this study seem to indicate that hardness, supervisor support, and group cohesion are significant predictors of job stress and hardness, supervisor support, and job stress are significant predictors of job satisfaction in a sample of corporate employees. Combined with other research, there seems to be moderate support for the assertion that psychological hardness and relationships in the workplace are related to job stress and job satisfaction. If this assertion holds true, health promotion interventions aimed at enhancing the hardness of employees, strengthening employee-supervisor relations, and establishing cohesive work groups have the potential to simultaneously lessen job stress and enhance job satisfaction. Further, future research should investigate the effectiveness of such targeted interventions and use a controlled prospective study design to determine causality as well as control for potentially confounding variables.

**References**


