Workplace Health Friendliness: A Cross-Level Model for Predicting Workers’ Health

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Two separate studies conceptualized the health friendliness of a workplace, the first qualitatively through content analysis of interviews with 69 nursing superiors about the means employed by their workplace to promote staff health. Findings supported the conceptualization of workplace health friendliness, which was further validated against the staff’s health indicators. The second study tested a model explaining the cross-level effects of workplace health-friendliness initiatives on workers’ health. The model depicted workers as rational human beings calculating costs/benefits in deciding whether to commit to those initiatives. Benefits represent workers’ potential gains through compliance; costs represent their potential losses. Perceived social costs were noted as a possible cost; a worker’s perceived stress signaled that he or she might benefit from joining health-friendly initiatives. Analysis of data from 45 nursing units supported the cross-level model: workplace health friendliness was positively associated with workers’ health and perceived social costs and stress moderated that link. Accordingly, workplace health friendliness should be regarded as the joint responsibility of the workers and the organization, and attention should be paid to the processes whereby these initiatives become enhancers or inhibitors of workers’ health.

Keywords: workplace health friendliness, stress, social costs, workers’ health

“It’s bizarre that the produce manager is more important to my children’s health than the pediatrician.”
—Meryl Streep, American Oscar-winning actress.

Recent trends favor the burgeoning interest in occupational well-being and workers’ health. Taking an instrumental perspective (Wright, 2003), scholars have suggested that the growing stress characterizing today’s workplace, coupled with spiraling health care costs and a tightening labor market, have raised the incidence as well as the costs of workers’ ill-health (Offerman & Gowing, 1990; Quick, Quick, Nelson, & Hurrell, 1997). Consequently, organizations have been compelled to show greater concern for workers’ health (Quick, 1999; Wright & Cropanzano, 2000). Other scholars have taken a more humanistic point of view (Wright, 2003), asserting that workers are entitled to a more health-friendly workplace that takes care of their health regardless of its benefit for the organization (Quick & Quick, 2004; Schaufeli, 2004; Wright, 2003; Wright & Cropanzano, 2000). Research on workers’ health and the ways organizations are committed to its pursuit seems timely.

In this study, we focus on Workplace Health Friendliness (WHF), defined here as institutionalized, structural, and procedural arrangements as well as formal and informal practices aimed to design, create, and maintain healthy work environments that allow individuals to foster their health in their workplace. The concept differs from existing conceptualizations of health climate (e.g., DeJoy & Wilson, 2003) or safety climate (e.g., Zohar, 2000). Organizational climate is the product of perceptions shared by members of an organization regarding aspects of its environment that inform role behavior, in this case health or safety behaviors; that is, the extent to which health or safety behaviors are rewarded and supported in any organization (Smith-Crowe, Burke, & Landis, 2003). Because focal organizational facets such as work health or work safety compete operationally with other facets (e.g., worker health vs. transaction efficiency, worker safety vs. productivity), the most relevant indicators here are enacted or instituted policies, procedures, and practices after being distinguished from formally declared counterparts and construed as emergent patterns indicative of true priorities at the workplace (Zohar, 2000). WHF might be perceived as an important, though insufficient, generator of employees’ perception of health/safety climate. Parallel thinking has emerged in re-
search of the work–family conflict—a specific aspect of workers’ health, where family-friendly policies and family culture are perceived as distinct facets contributing to reduced work–family conflict (Behson, 2002).

In many respects, the notion of WHF represents the convergence of workplace research and thinking in several related areas. In organizational behavior, researchers have focused on identifying the traits of “healthy” organizations (e.g., Delery & Shaw, 2001; Ferris, Hochwarter, Buckley, Harrell-Cook, & Frink, 1999; Jaffe, 1995). For example, Wilson, DeJoy, Vandenberg, Richardson, and McGrath (2004) presented and tested a model depicting three distinct domains of work life, namely job design, organizational climate, and job future, as potent predictors of workers’ health. Similarly, researchers of job stress have long been interested in delineating the job and organizational attributes that characterize healthy work environments (Wilson et al., 2004). Researchers of occupational safety and health have focused more on prevention, arguing that actions taken by organizations to promote workers’ health might consist of primary prevention, addressing the cause of the problem rather than constantly needing to repair the damage caused, or secondary (and even tertiary) prevention, dealing with how employees can change their responses to inevitable causes of problems to avert their ill effects (Quick, 1999; Schaufeli, 2004; Wright & Cropanzano, 2000). These preventive actions can be characterized as individual-oriented, to highlight the individual’s empowerment, self-reliance, and accountability for his or her health promotion, or oriented to the organization (the work unit) as a whole, focusing more on its primary responsibility for workers’ health (Schaufeli, 2004; Wright & Cropanzano, 2000). But increasingly, attention has shifted to organizational factors in diagnosing and remediying the potential blocks to health in organizations (Wilson et al., 2004).

Very few researchers, however, have tried to capture employees’ perceptions of health friendliness, namely their perceptions of structural and procedural arrangements that best promote health, or to test these conceptualizations of WHF (Wilson et al., 2004). Clearly lacking is a direct and systematic test of a model of WHF (Danna & Griffin, 1999; Wilson et al., 2004). The relevant work so far has been largely piecemeal, typically confined to tests of individual job or work factors and narrowly defined employee outcomes. Only scant research is to be found on the psychological mechanisms that help translate unit-level health friendliness actions into individual-level workers’ health.

The present study addressed these voids in previous research by suggesting a model for promoting workers’ health in occupational settings (see Figure 1). As input, our model focuses on grounded perceptions of WHF. The relationship between unit-level health friendliness and workers’ health is moderated by employees’ perceptions of their work environment, represented here by two moderators, perceived social costs and perceived stressors. Finally, workers’ health is considered in the model as a broad concept, which includes physical and mental health, as well as psychological well-being. This accords with the 1948 definition by the World Health Organization (WHO), which regards health not just as the absence of disease but a state of complete physical, mental, and social well-being. We now introduce the theoretical background to our hypotheses.

**Background and Hypotheses**

How does WHF impact workers’ health? Inherent in our definition of WHF is the idea that the organization’s policies and practices can make a wide-ranging impact on the health of employees. Physical health refers to an individual’s ability to perform physical activities free of role limitations due to physical problems, bodily pain, or general health status (Ware, Kosinski, & Keller, 1996); mental health refers to an individual’s capacity to realize his or her own ability, cope with the normal stresses of life, work productively and fruitfully, and contribute to his or her community (Jahoda, 1988). Hence, the concept of physical and mental health encompasses not only the state of health, but also the capacity to achieve it.

Theory and research of health psychology provide a theoretical basis for the link between health-friendly interventions and improved workers’ physical and mental health. According to this line of research, workplace interventions have several advantages. First, they reach more employees than individual-based interventions. Second, they can have recourse to social support in ensuring compliance with recommended health changes (Bamberger & Sonnensthul, 1996). Third, they can maintain behavior change. If the workplace environment is restructured so that cues and reinforcements for previous risky behaviors are replaced by those for healthy behaviors, relapse may be less likely (e.g., Hays, Hays, DeVille, & Mulhall, 2003). Hence, to promote
best workers’ physical and mental health, efforts should be focused on individuals, by educating and empowering them to nurture their health, and on organizations, to create a healthier environment that supports the individuals’ health-fostering efforts.

Hypothesis 1a: WHF is positively associated with workers’ physical and mental health.

Well-being refers to people’s multidimensional evaluations of their lives, including cognitive judgments of life satisfaction as well as affective evaluations of moods and emotions (e.g., Diener & Larsen, 1993). A theoretical ground for the link between health-friendly organizations and well-being is provided by the model of psychological contract (Rousseau, 1995). This contract concerns one’s belief in the terms of an exchange agreement between oneself and the organization (Rousseau, 1995). Although the psychological contract’s specific content is subjective and tends to differ from one individual to another, it is logical that maintaining a healthy work environment and pursuing workers’ health will be central to the workers’ expectations. In fact, a growing body of evidence indicates that maintaining the psychological contract, whether accurate or not, has proven to be associated with well-being and satisfaction, among other things (e.g., Gracia, Silla, Peiro, & Fortes-Ferreira, 2006; Robinson, 1996).

Hypothesis 1b: WHF is positively associated with psychological well-being.

Health promotion in the workplace, then, is a useful and adaptive behavior for people at work, and a practice that organizations may want to foster. But how does unit-level WHF affect each worker’s health level? Maintaining health-friendly structures, procedures, and practices at the unit level does not guarantee that workers will attend the programs, exploit the opportunities, or adopt improved health behaviors, emotions, and attitudes. Utilizing health-friendly initiatives is a public act, requiring communication between the worker, colleagues, and the organization; barriers having to do with social stig mata associated with illness and health must be overcome (Bamberger & Sonnensthul, 1996). An individual’s willingness to engage in this behavior, therefore, will be affected by personal and interpersonal concerns; for example, will it be embarrassing

Figure 1. Cross-level model for predicting individual level workers’ health indicators from unit-level WHF.
or stigmatizing. The creation of work environments conducive to effective health promotion programs requires an understanding of the moderating (situational) factors that both encourage and discourage this behavior.

As a first step to understanding the impact of WHF on workers’ health, in our cross-level model we depicted workers as rational human beings calculating the costs and benefits in deciding whether to commit to those initiatives. Benefits represent the workers’ potential gains from attendance, while costs represent their potential losses. As a possible cost, we focused on perceived social costs (Anderson & Williams, 1996); perceived stress was taken as a sign that the worker might benefit from joining health-friendly initiatives.

This is but one empirical investigation of WHF, so some decisions naturally had to be made about what types of costs and benefits to focus on. Clearly, other potential costs or benefits exist that might moderate the relationship between health-friendly policies and workers’ health (e.g., other available supports, perceived prestige of utilizing the initiative, stigma, etc.), but the purpose here is to illustrate how benefit is gained from WHF. Three criteria make our chosen costs and benefits appropriate for consideration as affecting the relationship: (a) they tap into critical attributes or properties that affect a worker’s decision to seek help (e.g., Anderson & Williams, 1996; Morrison & Vancouver, 2000); (b) perceived stress represents a potential benefit of taking up the workplace’s health-friendly initiatives whereas social costs refer more to a potential cost, thus embracing both costs and benefits; and (c) they convey both structural and social cues for members on how to behave. The cues are embedded in the work context, some structural such as work stress (Kahn, Wolf, Quinn, Snoek, & Rosenthal, 1964), others more social in nature, such as social costs (Anderson & Williams, 1996), which guide members on how to act, especially under uncertain circumstances (Smith-Crowe et al., 2003).

Social support literature is prolix on the potential social cost of seeking help. It highlights its negative effect, as it is experienced as potentially stigmatizing (Bamberger & Sonnenstuhl, 1996) and a threat to the worker’s self esteem and public image (Deelstra et al., 2003; Drach-Zahavy, 2004a; Nadler, 2002). These social costs include bothering colleagues by taking up their time or giving them extra work (Anderson & Williams, 1996), the threat of losing status (Blau, 1955), the threat of becoming stigmatized (Bamberger & Sonnenstuhl, 1996), harm to self or public image (Deelstra et al., 2003), admission of inadequacy (Nadler, 1991), and a perceived threat to self-reliance and feelings of empowerment (Brehm, 1966). Research has indicated that the higher the perceived cost of seeking support, the less help the worker seeks, with the obvious result of receiving less help (Anderson & Williams, 1996; Drach-Zahavy, 2004a). Studies have also demonstrated that to avoid social costs, individuals prefer to turn to colleagues with whom they are on good terms, even though they expect only marginal potential benefit from these requests and ignore other sources that they perceive as more likely to help, such as the supervisor, a professional, or another organizational authority (Drach-Zahavy, 2004a). In light of this, we propose that high perceived social costs might prevent workers from joining health-friendly initiatives, or from being fully committed to them. This in turn will impede the health initiatives–health outcomes relationship. By contrast, when perceived social costs are low, workers will be more inclined to join health-friendly initiatives, which in turn might improve their health.

Hypothesis 2. Perceived costs of performing health-friendly actions moderates the WHF–health outcome relationship such that it will be stronger with low perceived costs than with high perceived costs.

As part of the cost- and benefit-weighing process, employees might also consider whether it is worth their while to utilize the workplace’s health-friendly initiatives. This might be done in terms of the anticipated contribution of the health initiative to the worker. It is posited here that high perceived stress might precisely motivate workers to join health-friendly initiatives, or to be fully committed to them. This in turn might improve the health initiatives–health outcomes relationship. By contrast, when perceived stress is low, workers will be less inclined to join health-friendly initiatives, which in turn will impair the health initiatives–health outcomes relationship. Hence, the perceived level of stress might serve as an amplifier in the relationship between the WHF and workers’ health outcomes.

Hypothesis 3. Perceived stress moderates the WHF–health outcome relationship such that it will be stronger with high perceived stress than with low perceived stress.
Method

Research Outline

Two independent field samples were employed. In Study 1, a pilot, qualitative, and quantitative methods were used to portray supervisors’ perspective of WHF, as well as to validate it against four indicators of workers’ health perceptions and habits. On the basis of this conceptualization and operationalization, we tested our hypotheses in Study 2.

Study 1

Sample

Interviewees were 69 nursing superiors who were randomly sampled from five hospitals in Israel. The rationale for interviewing nurse superiors stems from recent leadership theories, which describe effective leaders as managing from the boundary (Druskat & Wheeler, 2003). Holding a position at the interface of the team and its organization, nursing superiors are a satisfactory source of information regarding WHF: it is they who lobby upper management about their unit’s health needs, and it is they who execute upper management’s policies by introducing and implementing them in the unit’s daily practice. Of the 69 superiors, 76.9% were women; their mean age was 42.83 years (SD = 6.68) and their mean tenure as superiors was 6.9 years (SD = 5.33). To validate the concept of WHF that emerged from the interviews, 420 staff nurses from the nursing superiors’ units were surveyed. A total of 64.5% were women; their mean age was 34.67 years (SD = 5.62) and their mean tenure as nurses was 8.9 years (SD = 4.33).

Measures

The interview. Interviews were held in the nursing superior’s office in each unit and lasted approximately 60 minutes. The interview covered the research questions by probing interviewees’ evaluation of the workplace’s role in promoting staff health, the range of institutionalized formal and informal practices that allowed nurses to foster their health within their working unit, the intensity of workplace initiatives, and their perceived effectiveness. The questions also pertained to the type of missing interventions that might further the goal of promoting workers’ health. The interviewer used no audio recording and participants were assured that they would remain anonymous.

The interviews and qualitative analysis followed Spradley’s (1979) approach. Data were analyzed in three steps. First, the individual participants’ responses to each question were listed in order of interviewee. Next the diverse responses to each question were assessed. The analyzer considered the following questions: Did the participants express similar opinions? Were there dominant themes in their answers? If a recurrent opinion was found for several participants, a statement that vividly illustrated their point of view was extracted from the interviews.

WHF scale. Content analysis of the interview identified five WHF themes in descending order of prevalence: health education programs, promoting a healthier environment in the workplace, free medical procedures, workers’ empowerment, and policy change (see Table 1). As to what was missing at the workplace for promoting a healthier environment, interviewees reported that the initiatives were mostly directed at promoting physical health, and much more effort was needed for promoting staff mental health and well-being, and reducing staff fatigue.

To operationalize the concept of WHF, and to measure it across unit-specific initiatives, a five-item Likert-type scale, ranging from 1 = not at all, to 5 = very much (based on the five themes that emerged in the content analysis), was developed. Each theme was briefly defined for the respondent, followed by the question: “To what degree do you believe your workplace has acted to promote this activity?” (α = 0.86).

Validation measures. Four items derived from previous research of individual’s health status (e.g., Baron-Epel, Haviv-Messika, Green, & Kalutzki, 2004) served as validation measures for our workplaces’ health friendliness. The first item referred to the worker’s smoking habits: “Do you smoke at least one cigarette per day?” (1 = yes, 2 = no). The second item referred to fitness: “Do you exercise for at least 20 uninterrupted minutes in any physical activity such as walking, jogging, or swimming?” (1 = never, 5 = almost every day). The third item concerned cholesterol level: “Do you suffer from high cholesterol?” (1 = yes, 2 = no). The fourth item measured perceived general health: “How would you evaluate your general health status?” (1 = terrible, 5 = excellent).

Procedure. Prior to data collection, several steps were taken to address ethical concerns and ensure the workplaces’ commitment to the study. First, superiors received a letter explaining the aim of the research as a study of nurses’ health. They were assured that our concern was not with specific nurses...
but with the unit. This secured confidentiality and would foster the nurses’ cooperation. Next, research assistants interviewed the nursing superiors about WHF mechanisms and initiatives. The goal was to create a rapport with them, dispel concerns and win their commitment, and introduce a time lag between measuring WHF and the nurses’ health. Based on content analysis of the interviews, a questionnaire was developed and administered to the same sample of nursing superiors approximately two months later. To validate the questionnaire, a short four-item health questionnaire was administered to between five and seven staff nurses in each of the nursing superiors’ departments.

Table 1

<table>
<thead>
<tr>
<th>Category</th>
<th>Example interventions</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Free medical procedures</td>
<td>Free mammography checkups</td>
<td>62.5</td>
</tr>
<tr>
<td></td>
<td>Other checks for identifying cancer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vaccination against smallpox</td>
<td></td>
</tr>
<tr>
<td>Health education programs</td>
<td>Correct posture</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Stress management and relaxation strategies</td>
<td></td>
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<tr>
<td></td>
<td>Preventing radiation effects</td>
<td></td>
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<tr>
<td></td>
<td>Preventing infectious SARS spread</td>
<td></td>
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<tr>
<td></td>
<td>Lifestyle improvement (e.g., nutrition, fitness)</td>
<td></td>
</tr>
<tr>
<td>Developing a healthier workplace</td>
<td>Availability of social worker/psychologist</td>
<td>83.3</td>
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<tr>
<td></td>
<td>No-smoking department</td>
<td></td>
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<tr>
<td></td>
<td>Accessibility to healthy meals</td>
<td></td>
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<tr>
<td></td>
<td>Fitness breaks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security guards</td>
<td></td>
</tr>
<tr>
<td>Staff’s empowerment</td>
<td>No smoking trustees</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>“Staff educate staff” programs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fitness trustees</td>
<td></td>
</tr>
<tr>
<td>Policy change</td>
<td>Price reduction for fitness centers</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>Free transportation to/from the workplace for night shifts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Promoting workplace smoke cessation rules</td>
<td></td>
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</table>

*Note. SARS = severe acute respiratory syndrome.*

Results

Table 2 presents a correlation matrix of the WHF scale with workers’ health indicators: smoking habits, fitness habits, cholesterol level, and general health perception. Note that workers’ health indicators were aggregates of individual responses to a unit-level measure. Interclass correlation (ICC) 1 and 2 were: 0.19 and 0.45 for staff’s smoking habits; 0.17 and 0.40 for staff’s cholesterol; 0.18 and 0.49 for staff’s fitness habits, and 0.14 and 0.46 for staff’s general health. All of these were comparable to the median or recommended ICC values reported in the literature.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) WHF scale</td>
<td>3.12</td>
<td>0.82</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Staff’s nonsmoking habits</td>
<td>1.72</td>
<td>0.44</td>
<td>0.23*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Staff’s low cholesterol</td>
<td>1.68</td>
<td>0.32</td>
<td>0.25*</td>
<td>0.19**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) Staff’s fitness habits</td>
<td>3.47</td>
<td>1.44</td>
<td>0.25*</td>
<td>0.14*</td>
<td>0.06</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>(5) Staff’s general health</td>
<td>3.03</td>
<td>0.85</td>
<td>0.22**</td>
<td>−0.10</td>
<td>0.17**</td>
<td>0.28**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. N = 420 level 1; n = 69 level 2.

Workers health indicators were aggregates of individual responses to a unit-level measure.

*p < .05. **p < .05.
We concluded that aggregation was justified for these variables. As indicated in Table 2, significant correlations were found between the WHF scale and four indicators of workers’ health: staff’s smoking habits ($r = 0.23, p < .05$), staff’s fitness habits ($r = 0.25, p < .05$), staff’s cholesterol ($r = 0.25, p < .05$), and staff’s perception of their general health status ($r = 0.22, p < .01$). These results provide support for the validity of our composite index of WHF.

**Study 2**

**Sample and Procedure**

Participants in this study were nurses from the same five hospitals as in Study 1 in 48 nursing units approached at random. Units that participated in Study 1 were excluded from the sampling procedure. Three of the 48 units had a policy of not participating in research, so 45 nursing units, representing medical, surgical, internal, and critical care, participated in the study. In each unit, all registered staff nurses (367) as well as their direct superiors were surveyed. In all, 246 staff nurses’ surveys and 45 supervisors’ surveys were returned, a rate of 100% and 66% (range = 58% to 77%) for supervisors and staff nurses, respectively. Each unit’s data included questionnaires of at least one supervisor and five staff nurses.

Unit size ranged from 5 to 20 nursing staff, with an average of 15 nurses ($SD = 8.23$). The sample was 73% women, with an average age of 38.31 years ($SD = 11.73$). Average job tenure was 13.12 years ($SD = 8.72$). For education level, the majority (63%) had a college degree, 31% had a bachelor’s degree, and 6% had a master’s degree.

Data were obtained through a survey of all nursing staff, including the nurse supervisor. Staff nurse surveys consisted of measures of stress, social costs, and health. Nursing supervisors’ data included measures of WHF.

**Measures**

WHF was measured on a five-item Likert-type scale (1 = *not at all*, to 5 = *very much*) developed specifically for the present study as described, together with its reliability and validity measures, in the “Method” section of Study 1. Cronbach’s alpha value was 0.87. To assess the measure’s reliability, we correlated supervisors’ assessments and staff nurses’ aggregated assessments of the WHF scale. We evaluated the appropriateness of aggregation by tests of $r_{wg}$, which indicated good within-group agreement: the median value was 0.82. ICC1 and ICC2 were 0.18 and 0.43. The correlation between staff nurses’ and supervisors’ assessments was moderate-high and significant ($r = 0.68; p < .001$).

**Stress** was measured by a three-scale stress questionnaire adopted from Haynes, Wall, Bolden, Stride, and Rick (1999). Six items concerned role overload (e.g., “I don’t have enough time to accomplish my work”), five items role ambiguity (e.g., “I know what my responsibilities are”) (reverse scoring), and four items role conflict (e.g., “I do things that are accepted by one person, but not by another”). Participants used a five-point scale from 1 = *not at all* to 5 = *a great deal*. Cronbach’s alpha value was 0.78.

**Perceived social costs** was measured by seven items on a Likert-type scale (from 1 = *strongly disagree* to 5 = *strongly agree*) derived from Anderson and Williams (1996). The wording of the items was changed so that they referred to workplace health initiatives instead of asking the supervisor for help. An example item was, “Joining health-friendly initiatives makes you feel adequate and incompetent.” To assess the perceived social costs we averaged the responses of the corresponding items. Cronbach’s alpha was 0.92.

**Workers’ health.** Three indicators of workers’ health were used: physical health, mental health, and well-being. Physical and mental health was measured by the physical and mental health components’ summary measures of the SF-36 health survey (Ware et al., 1996). The physical health component consisted of 10 items on the physical functioning scale, four items on the role physical scale, two items on bodily pain, and five items on general health. The mental health component consisted of three items on the role emotion scale, two items on social functioning, and four items on vitality. Subscale scores ranged from 0 to 100; lower scores indicated poorer health. Cronbach’s alpha was 0.78 and 0.82 for physical and mental health respectively. Well-being was measured by an eight-item Likert-type scale (from 1 = *never* to 5 = *always*) developed by Berkman (1971). An example item was: “How often have you felt pleased about having accomplished something?” ($\alpha = 0.78$).

**Results**

**Measurement Model**

Using confirmatory factor analysis (CFA), we assessed the validity of the six constructs of WHF,
stress, costs, physical health, mental health, and well-being. Parameter estimates were made using the maximum likelihood method. The six-factor model yielded an adequate overall fit, $\chi^2(1370) = 1444; p < .1; \text{CFI} = 0.95, \text{RMSEA} = 0.02$ (Kelloway, 1998), demonstrating convergent validity. The factor loadings for each item on its corresponding construct were above 0.35 and significant at the 0.05 level or better (the majority of the loadings in the model were above the 0.70s and 0.80s).

We then compared this model using $\chi^2$ difference tests against a second CFA in which all items were allowed to load on one factor. This CFA yielded an unacceptable fit, $\chi^2(1380) = 1552; p < .001; \text{CFI} = 0.82, \text{RMSEA} = 0.12$. The difference between the $\chi^2$ model and that of the six factor model suggested that the six factor model better fitted the data, $\chi^2(10) = 108; p < .001$. We also tested a four-factor structure that included the dimensions of WHF, stress and costs as one factor, and physical health, mental health and well-being as three others. This CFA also yielded an unacceptable fit, $\chi^2(1377) = 1548; p < .001; \text{CFI} = 0.84, \text{RMSEA} = 0.13$. The difference between the $\chi^2$ statistics of this model and the six-factor model was significant, $\chi^2(7) = 104; p < .001$. Thus, the six-factor model was the only model that exceeded acceptable measures of fit.

**Hypotheses Testing**

Table 3 shows means, SDs, and the intercorrelation matrix of the study’s variables. Table 4 presents the results of four separate Mixed Linear Model analyses for predicting physical health, mental health, and well-being from WHF, costs, and stress, as well as their interactions. A multilevel analysis was necessary since workers were nested in 45 different units at five different hospitals.

In line with Becker’s (2005) recommendation for treating control variables, we ran the Mixed Model analyses both with and without the control variables of supervisors’ gender and tenure (Level-2) and nurses’ gender, tenure, and education (Level-1). In the former case, these variables were entered in the model as a control for their effects, while in the latter case the control variables were eliminated from the analysis. This procedure was conducted to rule out the controls as a potential explanation for the findings. Because the results did not differ, we report only the results without controls (Becker, 2005).

With regard to physical health predictors, as expected, WHF had a significant positive effect on workers’ physical health. The two-way interaction

<table>
<thead>
<tr>
<th>Table 3: Means, SDs, Estimate of Reliabilities, and Correlation Matrix of Study's Variables</th>
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<tbody>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>(1) Nurses gender</td>
</tr>
<tr>
<td>(2) Nurses age</td>
</tr>
<tr>
<td>(3) Nurses tenure</td>
</tr>
<tr>
<td>(4) WHF</td>
</tr>
<tr>
<td>(5) Stress</td>
</tr>
<tr>
<td>(6) Social costs</td>
</tr>
<tr>
<td>(7) Physical Health</td>
</tr>
<tr>
<td>(8) Mental Health</td>
</tr>
<tr>
<td>(9) Well-being</td>
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<tr>
<td>Note. Scale reliabilities (Cronbach’s alpha) are presented on diagonal.</td>
</tr>
<tr>
<td>*p &lt; .05; **p &lt; .01.</td>
</tr>
</tbody>
</table>

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Table 4
Results of Four Mixed Linear Models Analyses for Testing the Predictors of Health Indicators

<table>
<thead>
<tr>
<th>Physical health</th>
<th>Model 1 Main effects</th>
<th>Model 2 Interactions</th>
<th>Mental health</th>
<th>Model 1 Main effects</th>
<th>Model 2 Interactions</th>
<th>Well-being</th>
<th>Model 1 Main effects</th>
<th>Model 2 Interactions</th>
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<tbody>
<tr>
<td></td>
<td>Estimate</td>
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<tr>
<td>WHF</td>
<td>6.83 **</td>
<td>1.97</td>
<td>14.98 *</td>
<td>6.83</td>
<td>22.34 *</td>
<td>6.69</td>
<td>48.33 *</td>
<td>22.79</td>
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<tr>
<td>Stress</td>
<td>-7.80</td>
<td>5.69</td>
<td>-1.80</td>
<td>19.76</td>
<td>-8.19 *</td>
<td>2.38</td>
<td>-3.01</td>
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<tr>
<td>Social costs</td>
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<td>1.39</td>
<td>-21.77 *</td>
<td>9.40</td>
<td>-1.65</td>
<td>1.68</td>
<td>-15.86</td>
<td>11.06</td>
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<td>WHF × stress</td>
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<td>3.34</td>
<td>16.17 **</td>
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<td>Stress × social costs</td>
<td>-21.70 *</td>
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<td>-29.57 **</td>
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<td>1.23</td>
<td>2.15</td>
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<td>SD of unit level intercept</td>
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<tr>
<td>SD of the residuals</td>
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<td>8.51 *</td>
<td>9.53 *</td>
<td>8.98 *</td>
<td>14.63 *</td>
<td>16.52 *</td>
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<tr>
<td>Δ2-2 Res LL</td>
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<td></td>
<td>13.22 **</td>
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<td>20.11 **</td>
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*Note. WHF = workplace health friendliness. N = 246 level 1; n = 45 level 2. p < .05. **p < .01.
effect of WHF and stress was significant. Results from simple effects tests revealed that contrary to our prediction, when stress was low, physical health was significantly higher under high than under low WHF, $t(112) = 3.76; p < .01$. When stress was high, no significant differences in workers’ health were found for high and low WHF ($t(108) = 1.15; p > .05$). The two-way interaction effect of WHF and social costs was significant. In support of our prediction, simple effects tests revealed that when social costs were low, physical health was significantly higher under high than under low WHF, $t(120) = 3.76; p < .05$. When social costs were high, no significant differences in workers’ health were found for high and low WHF, $t(118) = 1.38; p > .05$. These interaction effects are illustrated in Figures 2a and 3a.

With regard to mental health predictors, WHF was significantly and positively associated with mental health, whereas perceived stress was significantly and negatively associated with it. The two-way interaction effect of WHF and stress was significant. As predicted, simple effects tests showed that when stress was low, no significant differences in workers’ mental health were found for high and low WHF, $t(112) = 1.38; p > .05$. When stress was high, mental health was significantly higher under high than under low WHF, $t(120) = 3.86; p < .05$. The two-way interaction effect of WHF and social costs on workers’ mental health was significant. In support of our prediction, simple effects tests showed that when social costs were high, no significant differences in workers’ mental health were found for high and low WHF, $t(118) = 1.51; p > .05$. When social costs were low, workers’ mental health was significantly higher under high than under low WHF, $t(120) = 2.96; p < .05$. These interaction effects are illustrated in Figures 2b and 3b.

Finally, with regard to predictors of workers’ well-being, as hypothesized WHF was significantly and positively related to workers’ well-being, whereas perceived stress and social costs were significantly and negatively associated with it. The two-way interaction of WHF and stress was significant. Simple effects tests revealed, in accordance with the prediction, that when stress was low no significant differences in workers’ well-being were found for high and low WHF, $t(112) = 1.38; p > .05$. When stress was high, workers’ well-being was significantly higher (even equaling the well-being of low stress workers) under high than under low WHF, $t(120) = 3.65; p < .05$. The two-way interaction effect of WHF and social costs on workers’ well-being was also significant. In support of our prediction, simple effects...
Figure 3a
Physical Health: Means by WHF and Social Costs

Figure 3b.
Mental Health: Means by WHF and Social Costs

Figure 3c.
Well-Being: Means by WHF and Social Costs

Figure 3. Health indicators: Means by WHF and social costs.
tests revealed that when social costs were high, no significant differences in workers’ well-being were found for high and low WHF, \( t(118) = 1.83; p > .05 \). When social costs were low, workers’ well-being was significantly higher under high than under low WHF, \( t(120) = 6.05; p < .05 \). Surprisingly, the combination of low costs and low WHF yielded the lowest mental health level in our sample. The interaction effects are illustrated in Figures 2c and 3c. No other significant interaction effects were found.

Discussion

As growing health hazards, coupled with spiraling health care costs, figure as the common future of today’s organizations (Dwyer & Fox, 2000; Quick, 1999; Wright & Cropanzano, 2000), theoreticians and practitioners alike show greater interest in the issue of workers’ health (Schaufeli, 2004). Concomitantly, the consensus that “healthier-happier employees are power” is becoming widespread (Schaufeli, 2004; Wright & Cropanzano, 2000). The present study chose to focus on organizational as well as individual promoters of opportunities for workers’ health to flourish in the workplace, thereby contributing to the existing literature in several respects. First, qualitative data helped to portray a grounded conceptualization of WHF. Second, quantitative methods furnished support for the existence of a link between WHF and workers’ health. Third, our findings contribute to depicting a cross-level model that illustrates the process by which unit-level health-friendly initiatives are translated into better individual-level workers’ health. More specifically, our findings identified perceived stress and social costs as important amplifications and attenuations that moderate the relationship of WHF and workers’ health.

**WHF**

The concept of WHF highlights organizational actions aimed to design, create, and maintain healthy work environments, as well as healthy workers. Our findings showed that from the supervisor’s’ point of view at least, WHF referred to such interventions as availability of free medical procedures that help workers to monitor their health; health education programs to enrich the repertoire of workers’ coping strategies for health hazards in their work environment; structuring (or restructuring) a healthier workplace environment aimed at making it easy for workers to take control of their health; staff empowerment to take greater control of their health; and policy change toward greater awareness of workers’ health in the organization. This conceptualization of WHF differs from and corresponds to existing typologies of occupational health (e.g., Quick, 1999; Schaufeli, 2004) in several aspects. WHF corresponds to previous conceptualizations by regarding the organization and the worker as bearing joint responsibility for promoting workers’ health. True, the themes identified by nursing supervisors in the present study refer to organizational institutionalized structural and procedural arrangements, as well as formal and informal practices that allow individuals to nurture their health within their workplace; accordingly, responsibility for workers’ health rests, at least in part, on the organization. This is not surprising, given that the main theme of the interview was “what your organization can do to promote workers health.” Nevertheless, several practices such as workers’ empowerment and promoting a healthier workplace environment highlight joint responsibility of the workplace and its workers, thereby encouraging the latter to take a more active part in promoting their own health. Quick (1999) refers to individual-centered interventions as against work-environment interventions. Wright and Cropanzano (2004) discuss how to build a happy workplace, and differentiate training individuals from situational engineering. A second similarity concerns Quick’s (1999) distinction between primary and secondary prevention. Several of our WHF practices can be seen as primary interventions in that they do not focus on fixing what is broken, but aim at proactively enhancing the health of the work environment or the individual (e.g., creating a healthier workplace, changing policy). Other identified practices might be viewed more as secondary prevention (e.g., stress management and relaxation training) because they emphasize techniques of how to avoid the negative consequences of an inevitable work hazard (Quick, 1999).

Our WHF conceptualization differs from existing typologies by our adopting the internal customers’ (supervisors’) perspective on the workplace’s health-friendliness rather than relying on researchers’ professional conceptualizations. Ours is an empirically driven bottom-up conceptualization, rather than a “should” list of experts’ recommendations typical of the previous outlook (e.g., Quick, 1999; Wright & Cropanzano, 2004). This difference might explain why our conception of WHF does not include a more general job restructuring effort such as job enrichment practices or equitable pay (Wright & Cropanzano, 2004). One can argue that workers, or even supervisors, as lay people might not be able to link
such interventions to the betterment of health, so they may not be appropriate stakeholders for developing a WHF conceptualization. Yet the grounded perception is as important as the expert’s. Research has shown, for example, that workers’ autonomy might be a double-edged sword for them, enhancing their opportunities for job discretion, responsibility, and interest, but at the same time elevating the levels of stress (Drach-Zahavy, 2004b). Finally, the specific content of WHF shows that work units in our sample devoted most effort to promoting workers’ physical health while neglecting other aspects such as mental health and fatigue. This finding might not be surprising given the Israeli context in which employee mental health services (EAPs) remain a relatively rare phenomenon (Bamberger & Biron, 2006).

The Effectiveness of WHF

The two studies reported here also demonstrated the effectiveness of workplace health-friendly initiatives in promoting workers’ health. More specifically, positive associations were found between workplace health-friendly initiatives and physical health, mental health, well-being, and health behaviors: stopping smoking, controlling cholesterol level, and exercising more. These findings support previous findings in the health promotion literature and in the occupational health psychology literature (Bond, 2004; Kudielka, Von Kanel, Gander, & Fischer, 2004).

Perhaps the most important results of the present study were that perceived stress and social costs moderated the impact of WHF on workers’ health. These findings help to illustrate how unit-level WHF might affect workers’ health. As for perceived stress level, this prediction was based on the rationale that the higher the workplace’s stress level perceived by the workers, the higher their expected gains from taking up workplace health-friendly initiatives in terms of bettering their ability to cope with the stress hazards. The second study indicated that for two out of the three health indicators, namely mental health and well-being, stress amplified the impact of WHF on workers’ health. When stress was high WHF had an enhancing effect on workers’ health such that health remained intact under high WHF, but decreased significantly when workplace health-friendly initiatives were low. By contrast, when stress was low mental health and well-being stayed adequate, regardless of the level of WHF. Arguably, high stress serves as a crucial motivator for workers to commit to workplace health-friendly initiatives, whereas low stress does not; otherwise we should have expected an enhancing effect of WHF in workers experiencing low work stress too.

An exception to the amplifying impact of high stress in the relationship of WHF and health indicators was observed regarding physical health. Here our findings revealed a reverse pattern. Specifically, under low levels of stress WHF seems to have had an enhancing effect on workers’ physical health, while under high stress physical health remained intact, regardless of workplace health-friendly level of initiatives. Additional studies should examine whether this unexpected finding is an artifact of the present study or whether it is valid across settings and contexts.

A second moderator in our cross-level model was perceived social costs, namely what the workers stood to lose, in terms of harm to their self-esteem and public image, if they embraced workplace health-friendly initiatives. The findings revealed similar amplifying and attenuating effects of perceived social costs on the relationship of WHF and workers’ health in two out of the three health indicators (mental health and well-being). When social costs were high, namely workers perceived that seeking help might be costly in terms of stigmatizing, damage to self-esteem and public image, health indicators remained intact regardless of the intensity of workplace health-friendly initiatives. So when workers evaluated their potential gains from seeking help (better health) against potential losses, the perceived high social costs outweighed the expected gains from joining workplace health initiatives. As a result, workers’ health remained on the same despite the high level of WHF, perhaps due to low workers’ commitment to the initiatives. By contrast, when social costs were low, namely workers felt free to seek help since such a course was perceived as not carrying a cost, WHF had an enhancing effect on their health outcomes: health remained satisfactory under high WHF, but it decreased significantly when workplace health-friendly initiatives were low.

An unexpected finding emerged as well: the combination of low costs and low WHF yielded the lowest health indicators (mental health and well-being) in our sample. Why did workers’ health decline dramatically when the perceived costs of seeking support were low, but workers were provided only with low levels of workplace health-friendly initiatives? One theoretical model that could account for this unexpected finding is the model of psychological contracts (Rousseau, 1995). The specific content of the psychological contract is subjective, and
tends to vary in diverse situations (Rousseau, 1995). Perhaps under low social costs specifically, workers expect their work unit to provide help, guidance, and support because in these circumstances organizations are perceived as friendly and as encouraging help-seeking. When these expectations are not fulfilled (low workplace health-friendly initiatives) workers might perceive a violation or breach of their psychological contract, which further hampers their health. Further studies should try to support this explanation by measuring any breach in the psychological contract or job (dis)satisfaction, and examining whether the combination of low social costs and low WHF in fact leads to lower levels of satisfaction. This unexpected finding was not demonstrated with regard to physical health. Here the findings fully supported our predictions and indicated that under low perceived social costs, workplace health-friendly initiatives had a greater impact on workers’ physical health than under high perceived social costs.

**Limitations and Suggestions for Additional Research**

This study juxtaposed quantitative and qualitative methods, first to identify workplace health-friendly mechanisms to nurture workers’ health, and second to test their effectiveness. Nevertheless, the findings of this study must be considered in light of its limitations. First, the data were largely self-reported, hence subject to bias, although recent research suggests that self-reported data are not as limited as was previously believed, and that people often accurately perceive their social environment (Alper, Tjosvold, & Law, 1998). Moreover, regarding workers’ health status, Wright and Cropanzano (2000) argue that for any number of reasons self-report measures are and will continue to be an important information source in organizational research. However, non–self-report measures such as objective health indicators (e.g., heart rate, cholesterol level), as well as health behaviors including various mental disorders, alcohol and substance dependence, and suicide, to name just a few, merit increased scrutiny by further research (Wright & Cropanzano, 2000). In addition, in the present study the likelihood of common method variance was low because the conceptualization and validation of WHF were reached through qualitative and quantitative data, and because the predicting variable (WHF), the moderators (costs and stress), and the outcome (health) variables were obtained from different sources (Podsakoff & Organ, 1986). Additional research should use other sources for evaluating workers’ stress, such as objective indicators of the unit’s load (e.g., bed occupancy: Katz-Navon, Naveh, & Stern, 2005), or staff-to-patient ratio (Fox, Fox, & Wells, 1999). Second, as mentioned previously, we chose the specific moderators of perceived stress and social costs only as illustration of how the process of gaining benefit from WHF works on workers’ health. Additional research should explore other costs and benefits that workers might consider, such as other available support and the perceived prestige or effectiveness of the initiatives. A third limitation is the study’s inability to predict causal relationships. For example, it could be that poor employee health drives the adoption of WHF (Bamberger & Sonnenstuhl, 1996). Nevertheless, as the starting point for the research was a theoretical framework, experimentally examined in previous studies, causal inferences do seem to be the most logical. Future research should examine workers’ health as a dynamic criterion. That is, long-term prospective research designs could be constructed to examine the predictive impact of change in health over time (Adler & Weiss, 1988; Wright & Cropanzano, 2000).

Finally, the generalizability of the present findings should be examined in other types of units in addition to nursing, as well as in other cultures. For example, is the finding that hospitals neglect health initiatives toward improved mental health specific to the context of the present study, or can it be generalized across hospitals, cultures and nations? It is critical to assess any such differences so that insights can be tailored to specific circumstances. In particular, additional research should try to explore whether WHF in nursing units is sufficiently similar to other business or service units, or if they are so distinct as to require different ways of viewing and measuring the WHF phenomenon.

**Conclusions**

Workplaces and workers share responsibility in promoting workers’ health. The present findings indicated that the workplace can play an important part in this process by facilitating access to free medical procedures, initiating health education programs, structuring a healthier workplace environment, empowering staff, and leading policy change toward greater awareness of workers’ health. Workers, on the other hand, consider the social costs and potential benefits of relieving stress hazards in joining these initiatives, so they do not always fully utilize the opportunities provided by the workplace to promote...
their health. What advice might we give to practitioners on the basis of the present findings?

First, workplace health-friendly initiatives work. Nevertheless, concern for workers’ mental health in the workplace should enjoy efforts equal to those made out of concern for their physical health. Examples are availability of a social worker or a psychologist, positive thinking training, team support, and mentoring procedures. Fatigue should be the subject of special awareness, especially among shift workers, high reliability organization workers, and other workers exposed to fatigue hazards; likewise, the means to prevent it should be given particular consideration.

Second, it is not enough to suggest a wide range of workplace health-friendly initiatives for workers. These initiatives should be augmented by the generation of an organizational climate that highlights the benefits to workers of taking up these initiatives, and minimizes their perceived social costs. The findings suggested that the perceptions of social costs had a detrimental impact on workers’ ability to benefit from workplace health-friendly initiatives. Administrators who are concerned with enhancing workers’ health should therefore help them overcome perception and norm barriers, such as “Professional workers should cope by themselves.” This could be achieved by setting priorities in staff coaching and team building (Bamberger & Sonnensthul, 1996).

Third, our findings indicated that high stress is not a good motivator for workers to join workplace initiatives for physical health promotion. This implies that organizations should engage proactively in preventing physical health hazards especially before they occur. Otherwise workplace health-friendly initiatives might prove less efficient.

References


Appendix

The WHF scale

Below, common practices sometimes applied by organizations to help their employees maintain their health are listed. Please indicate for each item the extent you believe your workplace has acted to promote this activity (1 = not at all to 5 = very much).

1. **Health education programs** are programs provided by the organization to train workers how to maintain their physical and mental health such as stress management, relaxation training, and improved posture training.

2. **Promoting a healthier environment in the workplace** pertains to organizational arrangements that help workers promote their health, such as promoting “no smoking” units or accessibility to nutritious food.

3. Free medical procedures are free checkups, follow-ups, and immunizations that help employees control their health.

4. **Workers’ empowerment programs** pertain to workplace initiatives that encourage workers to take more responsibility for their own as well as their colleagues’ health, and to serve as health-promotion agents in their units such as women’s empowerment, “staff educates staff” programs, and fitness trustees.

5. **Policy change** are initiatives involving developing formal rules, guidelines, and human resource policies for promoting workers’ health such as rules for smoke-free departments and their enforcement, and transport arrangements for night-shift workers.

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