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Exposure to job stress — A new psychometric instrument

by Joseph J Hurrell Jr, PhD, Margaret A McLaney, PhD[1]

Historically, the term exposure assessment has connoted an evaluation of health risks posed by physical and chemical agents in the work environment. Exposure to psychosocial factors posing health risks has received little attention under this rubric. Knowledge of occupational stress, more particularly, relationships between work-related psychosocial stressors and health, is now sufficiently advanced to make occupational stress assessment necessary and prudent. Concerns of occupational health specialists are shifting to these psychosocial threats as physical and chemical risks are reduced as a result of improved industrial hygiene practices and the rapid growth of service occupations and industries.

The dominant methodology for examining psychosocial stress at work has been a questionnaire survey approach involving workers' self-reports of job characteristics and health-related complaints — the former achieving "stressor" status if correlated with the latter. While this approach has generated important findings, it has also proved problematic. Many job stress questionnaires, for example, have confounded measures of job stressors with items that reflect responses to stressful conditions (2). Another major problem is that assessment scales are seldom re-used in the exact form in which they were first developed. This situation, along with the frequent use of scales with unknown validity and reliability, has led to a problem of noncomparability between studies, and it has retarded the formulation of a much needed normative base.

Clearly, a need exists for a generic questionnaire instrument with a valid and reliable core set of scales that can be applied across occupational situations. Tailor-made scales could be added to this generic instrument as the need arises to capture the idiosyncratic factors which make any particular occupation difficult. Indeed, there is increasing pressure in the United States for such an instrument, owing in part to the mounting numbers of stress-related worker compensation lawsuits and the concurrent and growing necessity for organizations to document the effectiveness of stress reduction and stressor abatement interventions (1). The remainder of this paper describes efforts of the National Institute for Occupational Safety and Health (NIOSH) to develop such an instrument and briefly demonstrates the utility of this new instrument in identifying psychosocial stressors in the work environment.

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Instrument development

A schematic view of the theoretical approach to job stress that guided the development of the instrument (along with the specific constructs assessed) is presented in figure 1. In this scheme, *job stressors* refer to work conditions that lead to *acute reactions,* or strains, in the worker. These reactions represent more or less transient affective, physiological, and behavioral responses. Such short-term strains, in turn, are presumed to have an impact on longer-term indicators of mental and physical health. Three other components are included in the model: *individual factors, nonwork factors,* and *buffer factors.* These categories encompass a variety of factors that seem to lead to differences in the way workers exposed to the same job stressors perceive and/or react to them.

Specific stressor, strain, and mediating variable constructs were selected for inclusion in the instrument on the basis of a content analysis of recent job stress literature. The choice of empirical measures of selected constructs (scales) was guided by the following criteria: (i) evidence of validity and acceptable reliability, (ii) absence of stressor-strain confounding, and (iii) use in prior research (so as to provide norms for comparison). When no sound measures could be found, new multi-item scales were constructed.

Field testing

The questionnaire was administered to a stratified (on the basis of geographic region and type and size of employing facility) random sample of nearly 50 % of all union member nurses in the Canadian provinces of Newfoundland and Labrador. Nearly 700 nurses from over 50 different nursing facilities and 10 different nursing specialty areas participated. Each multi-item scale was factor-analyzed (using both principal components and principal factor methods), and the resulting factor-based scales were examined for reliability and comparability to standard construction formats. These analyses indicated that the factor-based scales had acceptable reliability (alpha) coefficients ranging from 0.65 to 0.90 (mean = 0.81) and that they compared favorably with the original construction formats.

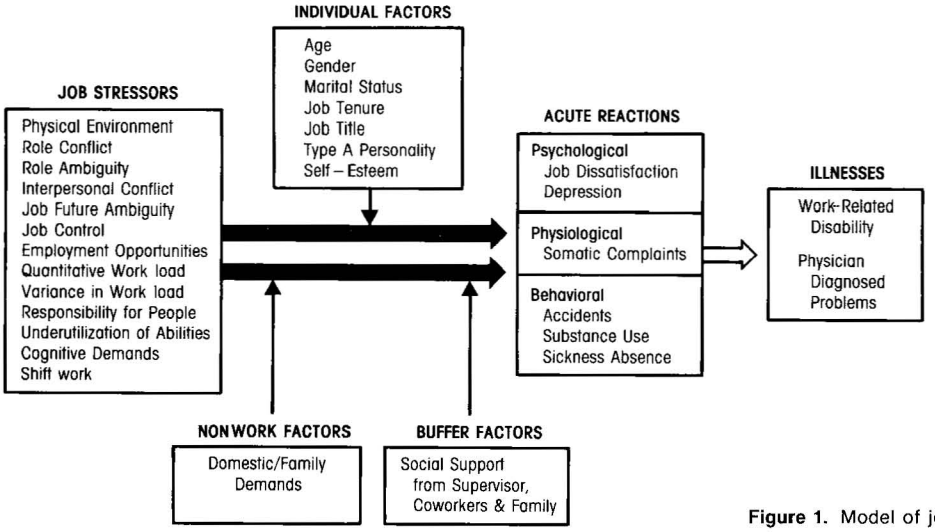

Figure 1. Model of job stress and health.

Instrument use

The remainder of this paper attempts to illustrate the potential for assessing risks in the psychosocial work environment with the use of the instrument. Other applications of the questionnaire (eg, stress monitoring) are possible.

Mean job stressor scores for the nursing sample were compared to existing (but as yet limited) occupational norms to identify probable stressors among nurses. These comparisons suggested elevations on the following six of the stressor variables: role conflict, role ambiguity, variance in work load, quantitative work load, job future ambiguity, and underutilization of abilities. To verify that these stressors were problematic for nurses and to gauge their potency/importance, stepwise multiple regression analyses were performed using the six stressors as predictors and job dissatisfaction and somatic complaints as criterion variables. Four of the six variables were significant predictors of job dissatisfaction (role conflict, beta 0.25, $R^2 = 0.14$, $P<0.001$; quantitative work load, beta 0.21, $R^2 = 0.03$, $P<0.001$; job future ambiguity, beta 0.16, $R^2 = 0.03$, $P<0.001$; and underutilization of abilities, beta 0.12, $R^2 = 0.01$, $P<0.001$). Three of the variables significantly predicted somatic complaints (role conflict, beta 0.19, $R^2 = 0.07$, $P<0.001$; variance in work load, beta 0.13, $R^2 = 0.01$, $P<0.001$; and role ambiguity, beta 0.11, $R^2 = 0.01$, $P<0.001$).

The aforementioned analyses suggest that role demands (particularly role conflict) and to a less extent quantitative work load, variance in work load, job future ambiguity, and underutilization of abilities were stressors for the nurses surveyed. To locate areas of greatest exposure to these stressors, mean stressor scores for each of the ten nursing specialty areas represented in the sample were examined. These analyses indicated that role demands appear to be elevated among both surgical and emergency room nurses. Moreover, both of these groups reported high levels of quantitative work load and variance in work load, a finding which makes them prime candidates for stressor abatement and/or stress management programs.

Future development

The NIOSH general job stress instrument is currently being further tested in a longitudinal study of the immunosuppressive effects of job stress. It is envisioned that the instrument will be made available to interested researchers, upon completion of this work, with the request that NIOSH be supplied with basic information generated from its use. To facilitate reporting, NIOSH anticipates developing a standardized reporting format. Reported information will, in turn, be made available to outside investigators.

References

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