DIFFERENTIAL PATTERNS OF EXPOSURE AND PREVALENCE OF MUSCULOSKELETAL SYMPTOMS, BY CLASS AND GENDER

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Introduction

An epidemiologic investigation was conducted at an appliance manufacturing facility in the U.S. to examine patterns of exposure to physical and psychosocial stressors and upper extremity symptom prevalence, by class (i.e., blue- versus white-collar) and gender.

Methods

A questionnaire was administered to 410 employees (81% participation rate) inquiring about demographics, medical history, work history, leisure activities, exposure, and symptom parameters by anatomical site. Fifty-four percent of the participants were blue-collar assembly or production support workers. Fifty percent of the blue-collar workers were male, compared with 77% of the white-collar workers (managers, engineers, clerical).

Ergonomic stressor questions were adapted from the 1995 U.S. Ergonomic Protection Standard's proposed checklist. A composite physical stressor score was computed by weighting factors by the Standard's intensity and duration criteria. Score values >5 defined high physical exposure. Measures of psychological demands and decision authority (i.e., job control) were selected from the Job Content Questionnaire. Job strain was computed from the ratio of psychological demands and decision authority, with high exposure defined by the upper quartile. Case status was defined as positive when site-specific symptoms lasted more than one week or occurred at least once per month in the past year, and symptoms developed after employment on the current job. Stratified analyses were used to examine associations.

Results

Overall case prevalence ranged from a low of 6% for the elbow, 18% for the hand/wrist, 22% for the neck/ shoulder, and 36% for any upper extremity site. Blue-collar workers had significantly higher prevalence, except for the neck/shoulder region. Excluding keyboard work, blue-collar workers had higher exposure to all other physical stressors, and blue-collar workers were disproportionately exposed to dual loads (i.e., both high physical load and high job strain).

Within blue-collar work, those with dual loads had more neck/shoulder symptoms (45% vs 27%, p=0.09), compared with those exposed to high physical load only. Further comparisons showed that those with dual loads (vs high physical) had higher levels of anxiety and fatigue, less job satisfaction, felt less job security, had less schedule control, experienced less co-worker support and greater group pressure, had higher mental demands, and greater postural loading on the neck. Limb motions were more rapid and steady, tasks more often externally paced, and those with dual loads had more difficulty "keeping up."

Women in blue-collar work were more often employed in assembly line operations, whereas men worked more in production support and repair. Correspondingly, women were employed in lower wage jobs, they performed more short-cycle tasks and their decision latitude (job control) was lower. Men exposed to high physical demands had higher exertional demands, such as forceful pushing / pulling and impact force. Women had a higher prevalence for the neck/shoulder (53% vs 16%) and for any UE site (58% vs 37%); this health disparity existed even among those workers exposed to dual loads.

Conclusion

The results of this analysis indicate that blue-collar workers are disproportionately exposed to both high physical demands and job strain, and the nature of these exposures vary between women and men. These findings highlight the need for epidemiologic analyses to more often include both class and gender-specific results, permitting examinations of differences in the nature and frequency of occupational exposures and important covariates. Larger studies are needed to further examine these differences and the effect of dual exposures on the risk for musculoskeletal disorders.

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