

LOST TIME INJURIES: DEMOGRAPHIC VARIABLES, SELF-REPORTS, AND OBSERVATIONAL ASSESSMENT OF OCCUPATIONAL DEMANDS

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Abstract

The purpose of this study is to determine if a relationship exists between disability claims records, age, gender, duration of employment, rates of perceived exertion, and the accuracy of self-reports of physical work demands. To obtain self-reports of physical work demands participants completed a questionnaire regarding the physical demands of their job. Job site analyses were subsequently performed, the results of which were considered the "standard" for comparison. The discrepancies between the participant's responses and the corresponding job site analyses were recorded. Average percent agreement is 49%. Supplementary results indicate that trunk flexion, working at heights, walking, horizontal reaching, and upper extremity pulling were frequently performed by subjects who had a disability claims history. The results of this study support the need for further research that examines the possible associations between perceptions of physical work demands and disability as well as the associations between workplace exposures and adverse human health outcomes.

Keywords: self report, occupational demands, injury

ABSENCES LIÉES AU TRAVAIL: VARIABLES DÉMOGRAPHIQUES, RAPPORTS SUBJECTIFS, ET ÉVALUATION PAR OBSERVATION DES DEMANDES OCCUPATIONNELLES

Résumé

Le but de cette étude est de déterminer s'il existe une relation entre les demandes de prestations d'invalidité, âge, sexe, durée de l'emploi, taux d'effort aperçu, et l'exactitude des rapports subjectifs pour les demandes physiques de l'emploi, les participants ont complété un questionnaire concernant les demandes physiques de leur emploi. Les analyses des sites du travail étaient performées et les résultats étaient considérés la mesure pour comparaison. Les désaccords entre les réponses des participants et les analyses des sites de travail correspondantes ont été enregistrés. Le pourcentage moyen en accord est de 49%. Les résultats supplémentaires indiquent que la flexion du tronc, travailler en hauteur, marcher, s'étendre horizontalement, et tirer avec les extrémités supérieures étaient souvent exécutées par les personnes avec des antécédents d'invalidité. Les résultats de cette étude appuient le besoin pour plus de recherche concernant les associations possibles entre la perception des demandes physiques d'un emploi et l'invalidité, également les résultants des effets des sites de travail sur la santé humaine.

Mots clés: rapports subjectifs, demandes occupationnelles, blessure

INTRODUCTION

Work injury prevention and management have reached a level of interest and funding that could not have been easily predicted. In effect, the human dilemma associated with injury has created an ethical need for efficient and effective injury prevention and management. Thus, there appears to be recognition of humanitarian morals and values that press for safer and more effective integration of the worker and the workplace (6).

The expenses associated with work related injuries is also a driving force in this renewed interest in the health and safety of workers (6). The costs of workers' compensation and insurance premiums are directly related to the frequency and duration of disability and as a consequence these factors have the potential to significantly affect profit margins.

With the growing recognition that job titles and/or an individual's perception of their physical work demands may be poor indicators for occupational exposure, there have been attempts to utilize alternative methods to obtain this information (5). At one extreme are studies in which individuals are asked whether they perform specific physical tasks in the workplace, and the corresponding responses are utilized as the dependent variables for analysis. This is a relatively simple and inexpensive method by which to obtain this data (5); however, there is a higher potential for the data to negatively affect the outcomes of rehabilitation programs where the primary goal is to return individuals to work as quickly and safely as possible. Returning an individual to work prematurely can potentially compromise health and safety and place an employee as well as their co-workers at risk of injury or re-injury. Alternatively, if it is identified that an individual is not functionally able to return to work in a timely manner, the cost of continued benefit payments escalates which in turn increases premiums unnecessarily.

PURPOSE

The purpose of this study is to determine if a relationship exists between disability claims records, age, gender, duration of employment, rates of perceived exertion, and the accuracy of self-reports of physical work demands.

METHODOLOGY

Subjects

The subjects comprised 108 part-time and full-time employees who volunteered and provided informed consent to participate. Forty-eight of the participants were women (44%) and 60 were men (56%). The mean age of the subjects was 41 years (range 16 to 57 years). Forty-three of the sample population were between the ages of 20 and 29 years.

The occupational groups represented in the participant sample included 53 cashiers (grocery store, 49%) and 23 shelf stockers (grocery store, 21%) as well as 32 manufacturing line workers (plastic textiles, 30%) who were employed in 16 different positions.

The average duration of employment for the entire population was four and a half years (range 0.16 to 23.75 years) which may be indicative of an inexperienced workforce, which is perhaps due to a relatively high staff turnover; overall, 72 participants (67%) had less than five years experience.

Eleven men (41%) and two women (40%) employed in plastics manufacturing had previously experienced a disability, which resulted in lost time from work and six (26%) shelf stockers had previously experienced a disability resulting in lost time from work.

Questionnaire

The participants were surveyed by means of a self-administered questionnaire. The questionnaire utilized in this study was developed by the researcher and was evaluated for comprehensiveness and clarity.

Job Site Analysis

Job site analyses were performed of each unique position represented by the participant population (18). The job site analyses consisted of approximately one hour of observation during which the observer(s) completed a questionnaire identical to that provided to the participants.

Statistical Analysis

The accuracy of self-reported occupational physical demands was assessed using a comparative analysis. Estimated frequency was compared to observed frequency, the percentage of full agreement being calculated as the proportion of a workers' estimates of frequency in the same category as the observed frequency. Subsequent to this, Chi Square analyses were completed with Minitab, version 9.2.

The relationships between disability claims history and gender, age, occupation, physical job demands, perceptions of physical job demands, and rate of perceived exertion were evaluated with contingency table methods. Once patterns were detected they were analyzed for statistical significance by Chi Square analysis. Significance level corresponded to $p < 0.05$.

RESULTS

Questionnaire versus job site analysis

The data utilized in this analysis was the reported frequency of each of the 20 tasks from the individuals who participated in the study. This information was compared to the frequency data produced via job site analysis.

The individual's ability to discriminate between levels of frequency according to a four point categorized scale was moderate. The average percentage of full agreement between self-reported and observed frequency was 49% for the 20 physical tasks on the questionnaire. That is, of all the physical tasks assessed, an average of 49% of the total number were designated the same frequency category by the participants and observer. The range of agreement was 29% to 64%.

In regard to the frequency of agreement between the reported and observed performance for each physical task and claims history there was no difference between those individuals who had a claims history and those who did not. The Chi Square values for the frequency of each of the physical tasks presented in the questionnaire ranged between ($X^2_1=0.00, p>0.05$) and ($X^2_1=2.58, p>0.05$).

Assessment of Occupational Exposures

Five physical tasks that were significantly associated with reported claims history. These tasks included walking, horizontal reaching, upper extremity pulling, ladder climbing, and

trunk flexion. In regard to trunk flexion it was found that all of the individuals who had reported a claims history were required to perform this task frequently or constantly ($X^2_1=108.00$, $p<0.001$).

Gender

The prevalence rate of reported disability claims history was 22% for the study population (17% men, 6% women). These prevalence rates were statistically significantly different between men and women indicating that men had a higher reported rate of disability ($X^2_1=4.73$, $p<0.05$).

Age

The prevalence rates of reported disability among two age categories was also considered. Twelve percent of those individuals aged up to and including 35 years reported a disability history. Ten percent of those individuals aged 36 years and older reported a disability history. The reported disability rate among these two groups was not found to be significantly different ($X^2_1=0.626$, $p>0.05$).

Occupation

An analysis of the relationship between occupation and disability prevalence revealed that disability rates were the highest among manufacturing occupations ($X^2_1=11.49$, $p<0.001$).

Rate of Perceived Exertion

It was generally found that for perceived exertion of hand movements ($X^2_1=3.89$, $p<0.05$), whole body push ($X^2_1=40.05$, $p<0.001$), and whole body pull ($X^2_1=34.49$, $p<0.001$) there is a tendency for those subjects with a previous claim history to report higher rates of exertion than those who do not have a history of disability. This result has to be interpreted with some caution based on the relatively low frequencies in some cells.

DISCUSSION

Strength of agreement between observed and self-reports

For all of the self-reported physical demands the degree of agreement regarding the frequency of task performance was moderate ($x=49\%$). This is an encouraging result, however possibly influenced by the utilization of relatively broad frequency categories. As previously mentioned, it has been found that at a dichotomous level (i.e. whether an activity was carried out or not), the accuracy of recall was good (8).

Frequency of physical demands

One limitation of the job site analysis approach utilized in this study is the possibility that the frequency of the performance of tasks would be under or over estimated by the observer. This potential for inaccuracy may be due to error associated with the task analysis procedure and interindividual differences in task performance. In these respects, the observation method cannot be considered a valid standard. Therefore, data analysis was restricted to a generalized comparison of self-reported frequency with an unrefined measure based on observation.

Although not statistically significant, the percentage of agreement was lowest for standing (29%) and highest for climbing ladders (64%). It is difficult to compare the analysis of the self-reported physical demands with that of other studies as the methodologies differ substantially. However, as previously noted, it has been found that the proportion of time (i.e. frequency categories) may be more difficult for subjects to estimate than a more direct

measurement (9). Pope et al. (1998) found that the validity of self-reported physical demands is satisfactory at a dichotomous level versus quantifying the details of the workload. For example, asking an individual whether they perform a task at all was found to be a more valid approach to assessing occupational exposures.

Occupational exposures

Although not being the focus of this study, the occupational exposure data collected is of particular interest. Occupation was also found to be significantly associated with reported disability rates. It was found that with the sample studied, those individuals who were employed in manufacturing occupations had significantly higher rates of reported disability ($X^2_1=11.49$, $p<0.001$). The essential tasks of the positions represented among this group were primarily manual materials handling. It should be noted that there is evidence of a strong association between manual materials handling tasks and reported low back pain and disability (3).

The essential tasks of the positions represented among this group were also noted to be highly repetitive in nature. It has been reported by Johansson and Rubenowitz (1994) as well as Fransson-Hall, Bystrom, and Kilbom (1995) that risk indicators for the upper extremities were higher exposures to repetitive movements. Johansson and Rubenowitz (1994) also found that heavy or frequent manual operations and repeated rotation of the trunk are risk factors for low back pain.

As noted in the results, it was found that there were five physical tasks that were significantly associated with reported claims history which were walking, horizontal reaching, upper extremity pulling, ladder climbing, and trunk flexion. These findings are consistent with results reported by Burdorf and Sorock (1997) who reported that among other exposures, frequent trunk flexion is strongly associated with low back pain. In regard to ladder climbing, the association with disability may be a result of falls from heights. These results should be interpreted with some caution as with the large number of tasks analyzed (20), some of the significant results may be due to chance. However, as noted these findings are consistent with the literature and there is reason to believe these results to be true.

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