The predictive capacity of declared musculoskeletal disorder at pre-employment screening

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Background
This study was undertaken at a major UK airport in response to management concerns about levels of sickness absence and impaired work capacity in the security department in order to investigate the possibility of achieving reductions through changes in pre-employment screening procedures.

Aims
To determine the predictive capacity of a declared musculoskeletal disorder (MSD) at pre-employment screening.

Methods
This study was based on the pre-employment health declarations of security workers. Work outcomes measured included sickness absence rates (including total and MSD-related absence), work restriction and ill-health retirement rates. Pre-employment questionnaires (PEQs) were analysed for 594 individuals who joined as security staff from 1993–2002. Those who declared an MSD were compared with those who did not using data from the human resources department and the occupational health records.

Results
Subjects who disclosed MSDs at pre-employment had significantly higher rates of subsequent total absence, MSD-related absence and work restrictions compared with those who did not. Potential confounders included sex, smoking, age and years in employment.

Conclusions
Pre-employment health screening can predict subsequent work outcomes. It is suggested that greater scrutiny is applied to declarations of an MSD at pre-employment screening in the potentially adverse manual handling environment of airport security work and that more advice is given to management about future risks of sickness absence and impaired work capacity.

Key words
Absence; musculoskeletal; pre-employment.

Introduction
Sickness absence and impaired work capability cause financial losses and operational difficulties for organizations. Recognizing which employees are more likely to have sickness absence or impaired work capability because of ill-health will help employers to make informed choices at the pre-employment stage, which should result in increased economic efficiency.

A high percentage of employees are passed fit for work without additional comment at pre-employment health assessments [1,2]. Evaluating the predictive capacity of the pre-employment questionnaire (PEQ) permits assessment of its potential value as an effective tool to identify applicants at increased future risk of sickness absence or impaired work capability. If the information declared at pre-employment screening is predictive of future work capability, this may enable evidence-based pre-employment guidelines to be developed. However, if the converse is true, then the value of such information is called into doubt.

Airport security work includes manual handling tasks involving repetitive frisking, lifting luggage and ‘paddling’ (the process of sweeping luggage along a conveyor with the arm). There has been little research on the specific occupational health risks for airport security workers and this has been confined to issues such as hearing loss [3] and respiratory symptoms [4]. This study was undertaken in response to the employer’s impression that there was an excessive incidence of sickness absence and impaired work capability resulting in restriction of work activities in the airport security department. However, there was no comparative data analysis available to support this view. The main aim of the study was to determine whether a declared previous history of a musculoskeletal disorder (MSD) at pre-employment screening predisposed to a greater subsequent level of sickness absence and/or work restrictions.
Methods

This study was undertaken as part of an MSc degree at the University of Manchester Centre for Occupational and Environmental Health and the study proposal was reviewed by an Ethics Committee Meeting in 2002 and considered to be ethically sound.

The members of the cohort consisted of new starters joining the airport security department from January 1993 to December 2002. Lists for each of these years were obtained from the human resources (HR) department. Information on sex, date of birth, cigarette smoking, alcohol consumption, height, weight and declaration of an MSD was obtained from the PEQ in the occupational health records (OHRs), held in the occupational health department. Information on relocations or ill-health retirement was found elsewhere in the OHR. Information was extracted from the PEQs and if applicable, dates of leaving were also recorded. Employee years of exposure were calculated from the start dates in HR department records, in conjunction with any record of leaving date in the OHR, if applicable. The HR department also provided lists of employees who had received ill-health retirement during this period and of all employees who were restricted in their job roles or relocated to other areas as well as sickness absence data for each subject. Each episode had a health condition category as a cause. Information on outcomes was entered into the SPSS database. This consisted of the following:

- Sickness absence for MSDs (‘MSD absence’)
- Sickness absence for all causes (‘Total absence’)
- Ill-health retirement
- Restrictions on work activities recorded.

Restriction rates were calculated by counting a restricted employee as one in the numerator (regardless of number and type of restrictions) and the number of years worked to two decimal places as the denominator. The retirement rate was calculated as a numerator of either zero, for a non-retired employee or one for a retired employee, with the number of years worked as the denominator. Sickness absence rates were calculated in days divided by years worked. Descriptive statistics were calculated for sickness absence rates per employee years of exposure for MSD declarer and non-declarer sections of the cohort. Restriction and ill-health retirement rates were calculated for declarer and non-declarer groups.

Comparison in relation to the distribution of confounders in the two groups was made using SPSS software. The non-parametric Mann-Whitney test was used for two independent samples in each comparison to derive a Z-value to give a corresponding P-value. Power calculations prior to this study used the assumptions that there would be 500 subjects, of which a quarter were declarers. A difference in sickness absence rates was used as the hypothesis to be tested. STATA software was used in these calculations to reveal a power in excess of 80%.

Results

The cohort consisted of 291 men and 307 women. Of these, only four individuals had missing PEQs. The mean age at start of work was 37.4 years with a standard deviation of 11.1 years. The age range was 17–55 years.

Analysis of the members by starting year is shown in Table 1. All PEQs were analysed for declarations concerning MSDs (n = 135). Restriction rates, total absence rates and MSD absence rates were all significantly higher in subjects who had declared an MSD than in non-declarers (n = 459; Table 2). Potential confounders consisted of sex, smoking, age and years in employment. There was no significant difference in these factors between the two groups, using the Mann-Whitney test. Other factors such as body mass index and alcohol intake were not prognostic of work outcomes. Retirement rates were not significantly different between the two groups.

Discussion

This study showed that a questionnaire tool at the pre-employment stage was predictive of future absence and work restriction rates in this group of workers. MSD declarer absence and restriction rates may have been higher because of the greater vulnerability of these individuals to the manual-handling environment in the security department. The lack of difference in retirement rates may be due to the small numbers of retirements in the cohort, which amounted to nine in total.

Poole [5] reviewed the literature on predicting sickness absence at the pre-employment stage with a view to providing evidence-based guidelines for assessment of conditions likely to influence future sickness absence

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<th>Year</th>
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rates, noting that ‘Very few prospective studies of risk factors for sickness absence have been undertaken’. Lucey [6], in a more recent study, used the risk table developed by Poole and showed that those in the high-risk group had a significantly higher level of sickness absence in the years following pre-employment assessment. Given that such predictions can be made, do pre-employment assessments result in communication of this element of risk to prospective employers, for instance in terms of a statement such as ‘fit with an increased risk of sickness absence’? In an audit of National Health Service pre-employment assessments, Lucey [1] found that 98.5% applicants were classified as fit, with additional comments qualifying fitness made to management in only 1.5% of cases. No applicant was declared unfit. Moshe et al [2] found similarly high acceptance rates in a study of white-collar workers and labourers. Additionally, they concluded that an occupational physician-evaluated questionnaire was as effective as a medical examination in terms of assessing fitness. Whittaker and Aw [7] in a further audit showed the most common form of assessment was by questionnaire alone. There was wide variation in mode of assessment and in restriction and rejection rates.

This study and others confirm that it is possible to make predictions from questionnaire evaluation, but the evidence of high rates of unqualified statements of fitness suggests that this information is not being used significantly in recommendations to employers.

It was assumed in data collection that all declarations were honest and not withheld because of a perceived prejudice to successful job application. However, the purpose of the study was to evaluate the predictive capacity of a ‘declared’ condition on the questionnaire and not whether the presence of an objectively confirmed MSD influenced subsequent employment outcomes.

In this study, MSDs were grouped together crudely and no distinction was made between different types of MSD. Further research is required to investigate the subsequent impact of the different types of MSD declared in this occupational group. Different occupational group studies have addressed specific MSDs such as back pain and its predictors [8], and shoulder pain prognostic factors for MSD absence [9], but more research in specific MSDs and airport work is required.

In this occupational group, the PEQ has been shown to be a useful predictive tool. This study pointed to the conclusion that as a group, those declaring MSDs at the pre-employment stage will have significantly higher subsequent sickness absence and work restriction rates when undertaking airport security work than non-declarers. Further research is needed to investigate the predictive capacity of the different ‘types’ of MSD with regard to anatomical site, functional impairment and previous treatment, before predictions of work outcomes can be made in respect of MSD declarers individually. This will help to identify at risk individuals in this potentially adverse manual-handling environment. According to research, a high level of unqualified statements of fitness are made as a result of pre-employment health screening and this seems to indicate a failure to identify and communicate to prospective employers important information regarding the risk of future sickness absence.

### Key points
- As a group those who declare musculoskeletal disorders at the pre-employment stage will have significantly higher subsequent sickness absence and work restriction rates when undertaking airport security work than non-declarers.
- Further research is required to investigate the predictive capacity of different types of musculoskeletal disorder declared at this stage in this occupational group.
- There is evidence of a current failure to identify and communicate to prospective employers important information regarding the risk of future sickness absence in job applicants.
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Conflicts of interest

None declared.

References