Applied Ergonomics 45 (2014) 1174–1180

Contents lists available at ScienceDirect

Applied Ergonomics

journal homepage: www.elsevier.com/locate/apergo

Demand-specific work ability, poor health and working conditions in middle-aged full-time employees

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ARTICLE INFO

Article history:
Received 6 December 2013
Accepted 14 February 2014

Keywords:
Depression
Job demands
Musculoskeletal pain

ABSTRACT

We investigated the prevalence of reduced demand-specific work ability, its association with age, gender, education, poor health, and working conditions, and the interaction between poor health and working conditions regarding reduced demand-specific work ability. We used cross-sectional questionnaire data from 3381 full-time employees responding to questions about vocational education, job demands and social support (working conditions), musculoskeletal pain (MSP) and major depression (MD) (poor health) and seven questions about difficulty managing different job demands (*reduced demand-specific work ability*). Reduced demand-specific work ability varied from 9% to 19% among the 46-year old and from 11% to 21% among the 56-year old. Age was associated with two, gender with four, and education with all measures of reduced demand-specific work ability. MSP was associated with four and MD was associated with six measures of reduced demand-specific work ability. We found no interaction between working conditions and poor health regarding reduced demand-specific work ability.

1. Introduction

Work ability reflects the balance between personal resources and job demands (Tengland, 2011; van den Berg et al., 2009). Previous studies show that both low personal resources, e.g. depressive symptoms and musculoskeletal pain, and demanding working conditions, e.g. high mental work load, high physical work load, low social support, and low work spirit, are associated with decreased work ability (Deyo and Weinstein, 2001; Elinson et al., 2004; Martimo et al., 2007; Martinez and Latorre, 2006; Miranda et al., 2010; van den Berg et al., 2008; van den Berg et al., 2009). Still, the potential interaction between low personal resources and high job demands when predicting poor work ability is seldom investigated. We hypothesize that low personal resources, as depression and musculoskeletal pain, have a larger negative effect on work ability under conditions of high job demands than under conditions of low job demands.

Reduced work ability is not necessarily global (Tengland, 2011). An employee's work ability can be reduced with regard to certain job demands but unaffected with regard to other job demands. Additionally, different health problems may have different effects on work ability. In theory, depressive symptoms will directly affect a person's cognitive function and thereby the ability to manage cognitive work tasks (McDermott and Ebmeier, 2009), while musculoskeletal pain affects a person's physical function, which can reduce engagement in physically heavy work in order to avoid pain (McCracken and Samuel, 2007). Accordingly, we hypothesize that depression and musculoskeletal pain have different effects on the ability to manage specific job demands. However, most studies report effects on overall work ability and not the effect on the ability to manage specific job demands (van den Berg et al., 2009).

This shortage of knowledge partly stems from that the most widely used questionnaire for the assessment of work ability, the *Work Ability Index* (de Zwart et al., 2002; van den Berg et al., 2009), concerns physical and mental work ability in broad terms. It is, however, necessary to identify which job demands the employee is unable to meet, if tailored intervention is to be made, and therefore, knowledge about how health problems affect the ability to manage specific job demands is warranted.

The *Work-Limitation Questionnaire* allows for an assessment of the respondent's difficulty managing a range of physical,

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http://dx.doi.org/10.1016/j.apergo.2014.02.007
0003-6870/

psychological, and social demands (Lerner et al., 2001; Munir, 2008). Yet, it is the case for the *Work Ability Index*, the *Work-Limitation Questionnaire*, and also the *World Health Organization Health and Work Performance Questionnaire* (Kessler et al., 2003) that the respondent is asked explicitly to assess the impact of his or her health on current work ability. This leaves the appraisal of the causal relationship between health and work ability to the responder and, furthermore, it results in a circular argument when statistically analyzing the association between health and reduced work ability. Consequently, neither the separate effect of poor health nor the interaction between poor health and high job demands on work ability can be investigated properly.

To sum up, the present study intends to contribute to the literature on work ability by studying the associations of poor health with perceived difficulty managing specific job demands and by studying the interaction between poor health and working conditions in relation to perceived difficulty managing specific job demands. By means of a new questionnaire, *'reduced demand-specific work ability'* was measured as difficulty managing seven different specific job demands without asking the respondent to appraise the influence of their health. Poor health was measured as musculoskeletal pain (MSP) and major depression (MD), and working conditions were measured as job demands and social support.

More specifically, the aims of this cross-sectional study was *first* to describe the prevalence of reduced demand-specific work ability in a sample of 46-year and 56-year old full-time employees, *second* to study the association of reduced demand-specific work ability with age, gender, and vocational education; *third* to investigate the association of MSP and MD with reduced demand-specific work ability; and *fourth* to investigate the interaction between specific working conditions (job demands and social support) and poor health (MSP and MD) in relation to demand-specific work ability.

2. Material and methods

2.1. Design, data collection and study population

We used cross-sectional questionnaire data from a subsample of the 2006-survey of *The Danish Longitudinal Study on Work, Unemployment and Health* (Christensen et al., 2006).

In 2000, a random sample of individuals aged 40 or 50 years by 1st of October 1999 ($n = 11{,}082$, response rate 68.5%, final sample 7588) was drawn from The Danish Institute of Governmental Research Longitudinal Register. This register contains data on 10% of the Danish population aged 15 years or older. Data for the survey were collected by postal questionnaires, including two reminders for non-respondents.

In 2006, 4893 of the now 46- and 56-year old baseline respondents (64.5%) returned a follow-up questionnaire which included questions on demand-specific work ability. The subsample used in the present paper comprised the 3381 participants who indicated the length of their vocational education and who were full-time employed (>30 h per week) at the time of the data collection. The distribution of gender, vocational education, health, working condition and reduced demand-specific work ability for each age group is presented in Table 1.

Table 1
Description of the participants in the two age-groups of the study. The letters in brackets (a-g) refer to the description of the variables measuring demand-specific work ability in Section 2.5.

	46-years old ($n = 1713$)	56-years old ($n = 1668$)
	Percentages (%)	
Gender		
Male	43.9	53.2
Female	56.1	46.8
Vocational education		
None	8.9	7.1
Semi-skilled worker	3.4	3.7
Skilled worker	38.4	39.9
Short education (<3 years)	11.3	11.3
Middle-ranged education (3–4 years)	27.7	27.3
Long education (>4 years)	10.3	10.7
Poor health		
MSP	21.2	27.2
Moderate to severe depression	4.4	2.7
Working conditions		
High physical job demands	13.4	11.1
High demands to accomplish high amounts of work	20.0	20.0
High demands to work fast	36.9	34.3
High demands to make quick decisions	68.9	65.5
High demands to remembering a lot of things	82.2	79.2
High emotional demands	27.8	25.7
Low social support from colleagues	62.8	57.5
Reduced demand-specific work ability (%)		
Physical (a)	14.5	18.0
Amount (b)	19.3	21.3
Pace (c)	15.5	16.9
Decision (d)	9.7	12.2
Memory (e)	12.4	14.1
Client (f)	8.9	10.8
Co-operation (g)	8.8	11.3

2.2. Poor health (MSP and MD)

The participants were asked three questions about MSP: i) Do you have pain in the upper part of your back or neck? ii) Do you have low back pain? iii) Do you have pain in other joints (e.g., fingers, shoulders, hips, knees, or ankles)? The six response options were 'yes, daily', 'yes, a couple of times each week', 'a couple of times each month', 'yes, but not more than once a month', 'yes, more seldom', and 'no, never'. We defined MSP cases as respondents that were severely affected by MSP, i.e. participants with daily MSP (i.e. answering 'yes, daily' to at least one of the questions on MSP) and we defined MSP non-cases as participants without daily MSP.

To measure MD we used the Major Depression Inventory (MDI) which contains a symptom list that covers the ICD-10 and DSM-IV symptoms of depression. The MDI includes 12 questions, for example, 'Have you felt low in spirits or sad? Have you felt that life wasn't worth living?' and 'Have you had trouble sleeping at night?'. The six response options ranged from 'all the time' (coded 5), 'most of the time' (coded 4), 'a slightly more than half of the time' (coded 3), 'slightly less than half of the time' (coded 2), 'some of the time' (coded 1) 'at no time' (coded 0). For each participant, a mean score was calculated according to the manual with higher scores indicating more depressive symptoms (range: 0–50) (Bech et al., 2001). Responders were dichotomized into participants with and without major depression (MD) (cut point by 26 points as recommended by Bech et al. (2001)).

2.3. Working conditions

A total of seven separate variables measuring job demands and social support were included in the study:

1) Physical job demands
2) Demands to accomplish high amounts of work