Job-specific workers’ health surveillance for construction workers
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Citation for published version (APA):

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Impact of mental health complaints on work ability among mental and physical construction work.

Boschman JS, van der Molen HF, Frings-Dresen MHW, Sluiter JK.

Int Arch Occup Environ Health. 2012 Dec 20 [Epub ahead of print]
Abstract

Purpose:
To gain insight into 1) the prevalence and incidence of common mental disorders (CMD) and low work ability among bricklayers and construction supervisors; 2) the impact of CMD on current work ability and work ability one year later; 3) the added value of job-specific questions about work ability for detecting signs of low work ability.

Methods:
We randomly selected 750 bricklayers and 750 supervisors. This sample was surveyed by means of a baseline questionnaire and a follow-up questionnaire one year later. Work ability was measured with the first three questions of the Work Ability Index and job-specific questions. Self-reported CMD were measured with instruments designed to detect a high need for recovery after work, distress and depression. We used univariate logistic regression to analyze the presence or absence of CMD as independent variable.

Results:
The prevalence and incidence of CMD among 199 bricklayers and 224 supervisors was 22%/10% and 32%/15%, respectively. The prevalence of low general work ability was comparable for both occupations (5%). CMD were associated with low current work ability and low work ability at follow-up (ORs 4.3-22.4), but not with a reduction in work ability one year later. Questions on job-specific work ability resulted in more indications of low work ability among both occupations than did questions on general work ability.

Conclusions:
Regardless of occupation, workers who report CMD at baseline have a high likelihood of current low work ability and low work ability one year later.
Introduction

Construction workers are at increased risk for several health problems. These health problems may affect workers’ productive potential and the ability of workers to perform their tasks. This may lead to temporary absence from work and ultimately to permanent work disability. Low work ability has been found to be a predictor of sickness absence and work disability in general as well as among construction workers. In occupational health care for construction workers, the assessment and improvement of work ability is necessary to prevent early dropout among workers.

Interventions aimed at improving work ability may be directed toward known risk factors or reduced personal abilities. Several determinants of work ability have been addressed among the general population and specifically among construction workers. Physical workload, such as awkward back postures, static work postures and repetitive movements, influence work ability. In addition to physical workload, a lack of support at work influences the work ability of construction workers. Furthermore, individual factors such as older age and obesity, are associated with a higher likelihood of reduced work ability. Interventions designed to improve work ability among construction workers have aimed to reduce physical workload, improve individual counselling and education, reduce of body weight or promote a combination of these factors. To our knowledge, mental health has not been adequately addressed in the search for effective strategies to improve work ability among construction workers.

Although physical and lifestyle factors are undeniably important to construction workers, mental health problems may deserve more attention. Meltzer et al. found a higher number of suicides among construction workers in England and Wales than among other occupations. Furthermore, our recent study of bricklayers and supervisors (unpublished) showed that a substantial percentage of these workers (5-20%) are at risk of common mental disorders (CMD) such as distress, depression or post-traumatic stress disorder. Based on this information it is important to monitor the mental health of both bricklayers and construction supervisors.

It is unknown whether CMD affect the work ability of construction workers. Because there is no typical ‘construction worker’, it is important to consider the specific construction occupations. We have chosen two large construction occupations, bricklayers and construction supervisors, to serve as the study population in the present study. These occupations are opposite in nature: the bricklayer has a repetitive job with high physical demands, whereas the construction supervisor is responsible for site management and is exposed to high mental demands. Based on these differences in occupational demands, we
hypothesised that CMD among supervisors would have more impact on their work ability than CMD among bricklayers.

Adapted and abbreviated versions of the Work Ability Index (WAI) have been used to gather information on work ability. A job-specific version might be seen as a valuable instrument for detecting low work ability in a specific occupation. Job-specific signs of low work ability may indicate potentially successful preventive measures for workers reporting functional limitations. However, before using a job-specific instrument to monitor work ability among construction workers, we must assess the added value of such an instrument compared to traditional questions about work ability.

This longitudinal study aims to provide insight into the impact of mental health on work ability at baseline as well as changes in work ability at the one-year follow-up among bricklayers and supervisors. We aimed at providing occupational health care professionals with applicable and individual-oriented information. Therefore, we have chosen to focus on the individual worker, instead of on the population as a whole. The main objectives of the present study where therefore to assess the following information among bricklayers and construction supervisors:

i) the prevalence and incidence of self-reported CMD and low work ability;
ii) the association between CMD and low (job-specific) work ability;
iii) the association between CMD at baseline and a reduction in work ability at the one-year follow-up.
iv) the added value of job-specific questions on work ability compared to general questions on work ability in terms of the percentage positively screened respondents.

Methods
Sample
We randomly selected 750 bricklayers and 750 construction supervisors from a Dutch registry comprising all employed Dutch construction workers. The participants received a questionnaire with the following sections: personal and job characteristics, work ability, mental health effects and safety issues and accidents. The survey was conducted from December 2009 to January 2011 and consisted of a baseline questionnaire and a follow-up questionnaire one year later. At baseline, all participants received a sealed envelope at their home address containing a postcard with the invitation to participate, a questionnaire survey and a lottery ticket. At follow-up, only those who had responded at baseline were sent another postcard, follow-up questionnaire and lottery ticket. Completing the questionnaires took approximately 20 minutes. The participants were asked to fully complete and return the questionnaire within two weeks. One reminder containing a postcard was sent to all participants after one week.
**Work ability**

Work ability was measured with the first three questions of the WAI, derived from the original instrument, which measure current general work ability compared to lifetime best work ability (0 = not able to work, 10 = best ever) and current physical and mental work ability compared to lifetime best (0 = very poor, 5 = very good).\(^{21,22}\) A priori, we had chosen to take the smallest detectable change (SDC) into account. The SDC (also referred to as Smallest Detectable Difference or Minimal Real Difference) is a technical solution to bridge the well known gap between population-based studies and individual clinical decisions.\(^ {23}\)

The SDC is defined as the smallest statistically significant change in measurement results and identifies the change score that falls outside the measurement error of a scale.\(^ {24}\) The calculation of the SDC was based on the standard error of the measurement (SEM) corrected for the 95% criteria and the two measurement points. SEM values from previous research on the WAI\(^ {25}\), calculated from test–retest measures in 97 stable subjects of a population of senior construction workers, were used. The SDC in general work ability was found to be 2.0 points. Therefore, we defined a reduction in work ability over time as a decrease of 2 points or more in the first item of the WAI.

Work ability regarding job-specific activities or tasks was also measured (0 = very poor, 5 = very good). For the purpose of the present study, we constructed questions on work ability in a job-specific context. These job-specific questions were based on activities in a specific occupation, mainly based on the activities found in a systematic literature review on occupational demands and health effects for bricklayers and supervisors.\(^ {13}\) The supervisors were asked how they perceived their work ability regarding the following physical tasks: standing, walking across the construction site, assisting at the construction site, seated computer activities and driving. The supervisors were also asked about the following mental tasks: coordinating tasks, making decisions, working under deadlines, performing two or more tasks at the same time, dealing with task interruptions and ensuring safety. Bricklayers were only asked how they perceived their work ability regarding the following physical tasks: standing, kneeling, repetitive hand-arm movements, working with a bent back, lifting and carrying, climbing, working with arms above shoulder height, working at heights, working with hand tools, driving and sitting.

**Common mental disorders**

CMD were operationalized by measuring need for recovery after work, distress and depression. The concept ‘need for recovery after work’ is believed to be a measure which bridges the stage between normal work-related effort and serious long term work related fatigue syndromes, such as burnout.\(^ {26,27}\) The need for recovery scale (Cronbach’s alpha: 0.78) has been found to be an adequate measure for early work-related symptoms of fatigue, for use in both health surveillance and scientific research.\(^ {27}\) Workers exceeding the
cut-off value for the ‘need for recovery’-scale (a total score of 54.54) are likely to have an increased risk for psychological disorders and related absenteeism. Examples of the 11-item need for recovery after work scale include “Because of my job, at the end of the working day I feel rather exhausted” and “Generally, I need more than an hour before I feel completely recuperated after work”. The items are answered with either a ‘yes’ or ‘no’.

Self-reported symptoms indicative for distress and depression were also assessed as CMD. Distress was measured with the distress screener (Cronbach’s alpha: 0.83), which is a valid tool for early identification of distress in workers. The questions include “During the past week, did you suffer from worry?” “During the past week, did you suffer from listlessness?” and “During the past week, did you feel tense?”. The items are answered on a 3-point scale (‘no’, ‘sometimes’ or ‘regularly or often’) indicating the respondent’s level of agreement with the question. Using the four-dimensional symptom questionnaire (4DSQ) distress score as reference standard, the optimal cut-off-point to discriminate distressed workers is set at 4 points, for which the sensitivity is 0.80 and specificity 0.73.

Symptoms indicative for depression were detected with at least one positive answer on the two-item depression screener. With this instrument symptoms indicative for depression are detected with a sensitivity of 96% and negative predictive value of 99%. The questions include “During the past month, have you often been bothered by feeling down, depressed, or hopeless?” and “During the past month, have you often been bothered by little interest or pleasure in doing things?” and are answered with ‘yes’ or ‘no’.

Analysis

Analyses were performed separately for the two occupational groups. Descriptive statistics were presented as percentage, mean, standard deviation (SD) and range. Work ability was dichotomised as normal work ability and low work ability. For general work ability, the cut-off was ≤ 5 points for the first question of the WAI. For mental or physical work ability, moderate, poor or very poor work ability was considered a sign of low work ability, compared to good and excellent work ability. We considered one or more answers in the categories of moderate, poor or very poor work ability on job-specific activities or tasks a sign of low job-specific work ability.

The cut-off values of the mental health instruments were used to calculate the prevalence and incidence of workers with symptoms of a high need for recovery after work, distress and depression. The prevalence of self-reported CMD at baseline have been previously reported. Mental health was dichotomised into ‘CMD’ (exceeding the cut-off value on one or more of the instruments) and ‘no CMD’ (not exceeding the cut-off value on any of the instruments). The incidence of CMD was calculated as the percentage of the respondents
reporting complaints at follow-up relative to the respondents reporting no complaints at baseline. Confidence intervals (CI) were calculated by using the Wald method.

The associations between 1) CMD (yes/no) at baseline and low work ability at baseline (yes/no); 2) CMD (yes/no) at baseline and low work ability at follow-up (yes/no) and 3) CMD (yes/no) at baseline and a reduction in work ability at follow-up were analysed using univariate logistic regression. Statistical significance was set at an alpha level of 0.05. We corrected for multiple analyses by using the Bonferroni correction.

To gain insight into the possible added value of the job-specific questions on work ability, we assessed the percentage of respondents who did or did not screen positive on low general, physical or mental work ability and those who did or did not screen positive on low job-specific work ability. The PASW Statistics 19.0 software was used to analyse the data.

Results
Characteristics of the study population
At baseline, the overall response rate was 39% among the bricklayers (n=262) and 46% among the construction supervisors (n=310). At follow-up, the response rate was 76% among the bricklayers (n=199) and 72% among the supervisors (n=224). All bricklayers were male. Of the supervisors in this study, one female supervisor responded. There were no statistically significant differences in age between respondents and non-respondents at follow-up. The characteristics of the individuals who responded both at both baseline and follow-up, are shown in Table 1.

Table 1: Demographic and job characteristics among bricklayers and construction supervisors participating in both a baseline and a one-year follow up survey, December 2009 to January 2011.
Prevalence and incidence of self-reported symptoms of CMD

In total, 32% (72/222) of the supervisors and nearly one-quarter (22%, 43/197) of the bricklayers were screened positive for at least one mental health complaint at follow-up (Table 2). At follow-up, one-quarter of the supervisors reported a high need for recovery after work (26%), whereas half as many bricklayers reported a high need for recovery (14%). Symptoms of distress occurred as often among the supervisors (7%) as among the bricklayers (6%). Symptoms of depression occurred among 19% of the supervisors and 14% of the bricklayers, respectively.

The incidence of a high need for recovery after work was 10% among the construction supervisors and 6% among the bricklayers. The incidence of symptoms of depression and distress were similar for both occupations: 10% and 3% among the bricklayers and 12% and 4% among the supervisors, respectively.

Table 2: Prevalence and incidence of CMD and low work ability among bricklayers and supervisors participating in a baseline and follow-up survey.

<table>
<thead>
<tr>
<th></th>
<th>Bricklayers</th>
<th>Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Relative frequency</td>
</tr>
<tr>
<td><strong>Prevalence</strong> (follow-up data)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMD</td>
<td>22 (16-28)</td>
<td>43/197</td>
</tr>
<tr>
<td>Low work ability</td>
<td>5 (2-8)</td>
<td>10/197</td>
</tr>
<tr>
<td>Low physical work ability</td>
<td>21 (15-26)</td>
<td>41/197</td>
</tr>
<tr>
<td>Low mental work ability</td>
<td>11 (7-16)</td>
<td>22/197</td>
</tr>
<tr>
<td><strong>Incidence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMD</td>
<td>10 (5-15)</td>
<td>15/153</td>
</tr>
<tr>
<td>Low work ability</td>
<td>4 (1-7)</td>
<td>8/190</td>
</tr>
<tr>
<td>Low physical work ability</td>
<td>3 (1-8)</td>
<td>4/135</td>
</tr>
<tr>
<td>Low mental work ability</td>
<td>9 (5-13)</td>
<td>15/173</td>
</tr>
</tbody>
</table>

Low work ability and job-specific work ability

Most of the bricklayers and the construction supervisors rated their general work ability as an 8 (ranging from 0 to 10). At follow-up, 5% (10/197) of the bricklayers reported low general work ability. (Table 2). Twice as many bricklayers reported low physical work ability (21%, 41/197) as low mental work ability (11%, 22/197). Among the construction supervisors, 4% (9/223) reported their general work ability as low. The numbers of supervisors reporting
low physical or mental work ability were comparable: 13% (30/223) and 15% (33/223), respectively.

Regarding task-specific work ability among construction supervisors, 5% (11/222) to 18% (40/222) of the supervisors reported low work ability for job-specific tasks. A substantial proportion of the supervisors indicated that they did not perform the tasks ‘assisting at the construction site’ and ‘seated computer activities’ (28% and 11%, respectively). The three highest percentages of low work ability were found for the items ‘assisting at the construction site’ (18%, 40/222), ‘seated computer activities’ (17%, 25/221) and ‘handling task interruptions’ (16%, 36/220).

Among the bricklayers 8% (15/196) to 52% (101/196) reported low work ability for their job-specific tasks. The three highest percentages among the bricklayers were found for the items ‘working with a bent back’ (52%, 101/196), working with the arms above shoulder height (50%, 98/196) and kneeling (47%, 91/193).

Tables 3 and 4 present an overview of the percentages of supervisors (Table 3) and bricklayers (Table 4) who did or did not screen positive for low job-specific work ability. We found that a substantial number of construction workers reported normal general work ability but low job-specific work ability (25% of the supervisors and 72% of the bricklayers). Of the 154 bricklayers and 192 supervisors who reported normal physical work ability a substantial proportion reported low job-specific work ability (71% and 28%, respectively).

The same pattern was found among construction supervisors regarding their mental work ability: the questions on job-specific mental work ability resulted in more indications of difficulties (a total of 29%, 64/222) than the general question on mental work ability (15%, 33/220). In contrast, few (a maximum of three) bricklayers and supervisors reported low mental or physical work ability but normal job-specific work ability.

**Associations between CMD and low work ability**

For bricklayers, CMD at baseline were significantly associated with low physical (OR 4.3, 1.4-12.9) and low mental work ability (OR 4.3, 1.3-14.0) at the same time point and at the one-year follow-up (OR 6.0, 1.8-19.8; OR 6.7, 1.5-29.1). CMD were not significantly associated with general work ability at baseline nor follow-up (Table 5).

Construction supervisors with CMD were at increased risk for low general work ability (OR 16.9, 2.4-120.7), low physical work ability (OR 9.8, 2.6-37.0) and low mental work ability (OR 8.9, 3.0-26.8) at baseline. At one-year follow-up, CMD among supervisors were associated to low physical (OR 4.9, 1.4-18.1) and low mental (OR 22.4, 4.0-126.2) work ability only. For both bricklayers and supervisors the presence of CMD at baseline was not associated with a
decrease of 2 points or more in general work ability one year later (OR 2.1, 0.6-7.5 and 0.6, 0.2-2.0, respectively) (Table 5).

For both occupations, the presence of CMD was associated with low work ability for both physical and mental job-specific tasks. The highest associations with CMD were found among the supervisors for the job-specific tasks ‘performing two or more tasks at the same time’, ‘handling task interruptions’, ‘decision making’ and ‘working under time pressure’.

Table 3: The percentage of supervisors (n=222) in the categories of normal or low work ability and normal or low job-specific work ability at follow-up.

<table>
<thead>
<tr>
<th></th>
<th>Low job-specific mental work ability</th>
<th>Normal job-specific mental work ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low general work ability</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Normal general work ability</td>
<td>25%</td>
<td>70%</td>
</tr>
<tr>
<td>Low general mental work ability</td>
<td>14%</td>
<td>1%</td>
</tr>
<tr>
<td>Normal general mental work ability</td>
<td>15%</td>
<td>70%</td>
</tr>
<tr>
<td>Low general physical work ability</td>
<td>12%</td>
<td>1%</td>
</tr>
<tr>
<td>Normal general physical work ability</td>
<td>24%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Table 4: The percentage of bricklayers (n=195) in the categories of normal or low work ability and normal or low job-specific work ability at follow-up.

<table>
<thead>
<tr>
<th></th>
<th>Low job-specific physical work ability</th>
<th>Normal job-specific physical work ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low general work ability</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>Normal general work ability</td>
<td>72%</td>
<td>23%</td>
</tr>
<tr>
<td>Low general physical work ability</td>
<td>21%</td>
<td>0%</td>
</tr>
<tr>
<td>Normal general physical work ability</td>
<td>57%</td>
<td>23%</td>
</tr>
</tbody>
</table>
Table 5: Associations between workers with CMD compared to workers with no CMD and 1) low work ability at baseline; 2) low work ability at one-year follow-up and 3) a reduction in general work ability at follow-up.

<table>
<thead>
<tr>
<th></th>
<th>Bricklayers</th>
<th>Construction supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>99.8% CI</td>
</tr>
<tr>
<td><strong>Baseline associations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low general work ability (n=258)</td>
<td>11.5</td>
<td>0.9-143.3</td>
</tr>
<tr>
<td>Low physical work ability (n=221)</td>
<td>4.3</td>
<td>1.4-12.9</td>
</tr>
<tr>
<td>Low mental work ability (n=261)</td>
<td>4.3</td>
<td>1.3-14.0</td>
</tr>
<tr>
<td>Standing (n=257)</td>
<td>3.1</td>
<td>1.1-9.0</td>
</tr>
<tr>
<td>Kneeling (n=260)</td>
<td>2.8</td>
<td>1.1-7.2</td>
</tr>
<tr>
<td>Repetitive arm-hand movements (n=258)</td>
<td>2.5</td>
<td>1.0-6.3</td>
</tr>
<tr>
<td>Working with a bent back (n=260)</td>
<td>2.8</td>
<td>1.1-7.4</td>
</tr>
<tr>
<td>Lifting and carrying (n=259)</td>
<td>2.2</td>
<td>0.9-5.4</td>
</tr>
<tr>
<td>Climbing (n=259)</td>
<td>2.4</td>
<td>0.9-6.4</td>
</tr>
<tr>
<td>Working with arms above shoulder height (n=259)</td>
<td>2.1</td>
<td>0.8-5.4</td>
</tr>
<tr>
<td>Working at heights (n=208)</td>
<td>1.6</td>
<td>0.5-4.6</td>
</tr>
<tr>
<td>Working with hand tools (n=237)</td>
<td>1.3</td>
<td>0.5-3.4</td>
</tr>
<tr>
<td>Driving (n=144)</td>
<td>1.2</td>
<td>0.3-5.2</td>
</tr>
<tr>
<td>Sitting (n=162)</td>
<td>2.7</td>
<td>0.6-11.3</td>
</tr>
<tr>
<td><strong>Follow-up associations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low general work ability (n=196)</td>
<td>5.8</td>
<td>0.7-46.4</td>
</tr>
<tr>
<td>Low physical work ability (n=196)</td>
<td>6.0</td>
<td>1.8-19.8</td>
</tr>
<tr>
<td>Low mental work ability (n=196)</td>
<td>6.7</td>
<td>1.5-29.1</td>
</tr>
<tr>
<td><strong>Reduction in work ability at follow-up</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction general work ability ≤ 2 points (n=193)</td>
<td>2.1</td>
<td>0.6-7.5</td>
</tr>
</tbody>
</table>

1 None of the supervisors without CMD reported low work ability for 'coordinating of tasks'. In comparison, 10% (10/97) of the supervisors with CMD reported low work ability for this task.
Discussion

In the present study, we focused on two particular construction occupations that are very different in nature, bricklayers and supervisors. A substantial proportion of the workers in both occupations report CMD. We found that within physically demanding construction occupations, these mental health problems are associated with both current low work ability and low mental work ability and low physical work ability one year later. Therefore, the focus on physical health effects among physically demanding construction occupations may be questioned. Mental health problems appear to be an important area of interest in both mentally and physically demanding construction work.

We asked bricklayers and supervisors about their general, physical and mental work ability and their work ability regarding job-specific tasks. By asking the worker specifically about their self-perceived work ability in daily tasks, it was possible to screen for problems or restrictions in work functioning. In the present study population, nearly three-quarters of the bricklayers reported some type of low work ability for one or more of their daily tasks. This finding applied to one-quarter of the supervisors. Based on our findings, job-specific screening provides more specific signs of low work ability for both construction occupations than general questions on work ability.

Strengths and limitations

Our study provides detailed information on the impact on work ability of self-reported CMD among two types of construction occupations. These findings provide important knowledge to the industry regarding an evidence-based and goal-oriented approach to health effects. Furthermore, this study is the first to explore the association between CMD and low work ability among construction workers.

We did not find an effect of CMD on a further reduction in work ability one year later. Workers with CMD do not seem to experience a further deterioration in their work ability in the following year. However, we did find that workers with CMD are at increased risk for low work ability one year later. In order to increase insight in the data, we verified afterwards the proportion of the workers with CMD at baseline that sustained low work ability from baseline to follow-up. Among the bricklayers, half of the bricklayers sustained low mental work ability, whereas this applied for 70% of the supervisors. Of the bricklayers, 80% sustained low physical work ability, while this applied for nearly half of the supervisors. Among both occupations, one third of the workers sustained low general work ability.

With respect to these findings certain limitations must be taken into account in the present study. Our study design does not allow causative statements on the relationship between mental health effects among bricklayers and supervisors and their work ability at baseline.
It is possible that the association is reciprocal: reduced work ability, irrespective of the cause, may also affect psychological well-being. To study this relationship, a cohort study with a baseline population free of symptoms and more frequent follow-up measurements, is warranted.

Physical health effects and musculoskeletal complaints may affect mental health and work ability. Comorbidity may have been a source of confounding in the present study. However, even when CMD are not the main cause of low work ability, our results suggest that occupational health care professionals should watch CMD. When counselling workers with low work ability, it is advisable to include mental health issues, irrespective of the type of occupation.

Although the baseline response was rather low, our follow-up response was good (75%). A high loss to follow-up may affect validity, but this effect is likely to be minimal in the present study. Furthermore, we only analysed the questionnaires of respondents currently working as bricklayers or supervisors. Some previous bricklayers or supervisors may have changed their occupation due to their mental health problems or insufficient work ability. Therefore, our results on the association between CMD and future low work ability may be biased. However, when analysing the results of the respondents who were not working in these occupations at follow-up, the results may be contaminated and less generalisable.

In addition to loss to follow up, the validity of this study may be affected by the low total response rate, but it is uncertain how this rate affects the survey results. We may have underestimated the prevalence and incidence of CMD and low work ability because unhealthy persons are known to participate to a lesser extent. It should be noted that we explored CMD with screening instruments, which may have led to a higher reported prevalence and incidence than is found for diagnosed disorders. Furthermore, we assessed both short term adverse health effects, a high need for recovery after the work day, and the more prolonged and serious CMD. The reader should bear in mind that a substantial portion of the workers reporting ‘CMD’, are workers reporting a high need for recovery also.

Research aimed at testing for changes, has most often a focus on mean changes across samples of subjects. By doing so, changes in individuals might be obscured. Some subjects might have changed, but the difference in means might not be significant. However, when screening for adverse health effects in occupational health care, the focus is on the individual worker. In the present study we have therefore chosen for an outcome measure which focuses on the individual worker, instead of on the population as a whole. After all, for the individual worker there are only two options: he or she has low work ability or not. By using the SDC and a priori defined definition of low work ability, the situation for the individual can be captured. However, beside the pros this approach is not without its cons, two to
be mentioned here. The SDC for example does not have to reflect a clinically important or meaningful change. Next, to distinguish workers with low work ability from workers with normal work ability is we defined, a priori and by consensus in the research team, a cut-off value. This value was based on the educational grading system in the Netherlands, in which a 5 or lower is regarded as insufficient. Although this cut-off value provides an individual judgement on a scale with common meaning, it is arbitrarily.

**Implications**

Construction workers who report CMD have a high likelihood of reduced work functioning, regardless of occupation. Occupational physicians involved in health care for construction workers, should therefore be aware of the relevance of screening for CMD in this industry, among other work-related health issues. Periodically monitoring both mental well-being and work ability seems a recommendable strategy. On the one hand, CMD can be detected in an early stage and a deterioration in work ability can possibly be prevented. On the other hand, when a worker experiences limitations in their work ability, it should be assessed whether their mental well-being is compromised and preventive actions are needed.

Because of the predictive value of low work ability for sickness absence and work disability, the WAI is frequently used in occupational health care. However, due to the multifactorial nature of work ability and high associations with lifestyle and ageing, the WAI is probably not an appropriate measure to evaluate the effect of job-specific preventive measures. Especially among workers with a high WAI score it is difficult to obtain knowledge on changes in daily work functioning by using the WAI. Therefore, the added value of the job-specific questions on work ability should be emphasised. The job-specific questions could be used for a more in-depth evaluation of work functioning and to verify the target of possible preventive measures. Furthermore, these questions facilitate the evaluation of the effect of these measures on work ability. Further research is warranted to explore the added value of job-specific questions on work ability when directing and evaluating job-specific interventions.

**Conclusions**

We found that a substantial proportion of the bricklayers (22%) and supervisors (32%) reported CMD. Low general work ability was found among 5% of the workers. Workers with CMD were at increased risk for low mental and physical work ability (ORs between 3.0 and 22.4), irrespective of type of construction work. However, CMD do not increase the likelihood for a reduction in work ability over the course of one year. The use of job-specific questions on work ability is valuable when the aim is to screen for specific signs of impaired work ability among construction workers and target preventive actions.
References


