Frequent sickness absence, a signal to take action

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CHAPTER

Associations of work ability with frequent and long-term sickness absence

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Abstract

Background: Reduced work ability is related to long-term sickness absence. The relationship between work ability and frequent sickness absence has not previously been investigated. It is important to distinguish between frequent and long-term sickness absence as they are outcomes of different processes.

Aims: To investigate the associations of work ability with frequent short-term (three or more episodes lasting <two weeks in the past year), long-term (one or more episodes lasting at least two weeks in the past year), and combined (frequent and long-term) sickness absence.

Methods: In 2010–2012, we invited employees working in different economic sectors to complete a postal questionnaire measuring work ability using the work ability index (WAI). We compared the WAI scores in employees with frequent, long-term, and combined sickness absence with the scores in employees without such sickness absence by multinomial regression analysis.

Results: Of 6682 invited employees, 3660 employees (55%) completed the questionnaire. Mean (standard deviation) WAI scores were 41.2 (3.4), 39.4 (3.9), 37.2 (5.2) and 43.2 (2.7) in employees with frequent, long-term, combined sickness absence, and neither frequent nor long-term sickness absence respectively. WAI scores were negatively related to frequent (odds ratio [OR]=0.85; 95% confidence interval [CI] 0.82–0.88), long-term (OR=0.79; 95% CI 0.75–0.82), and combined sickness absence (OR=0.74; 95% CI 0.71–0.77).

Conclusion: Self-reported reduced work ability is associated with both frequent and long-term sickness absence, suggesting that frequent sickness absence is not only driven by motivational processes.

Introduction

Sickness absence is a substantial problem for employers and employees. For employers, frequent short-term absences interfere with work schedules and organization. Long-term sickness absence necessitates the replacement of absent employees or additional work by the remaining staff. For employees, long-term sickness absence distances them from the workplace and may result in social isolation and poverty [1]. Frequent sickness absence affects social relations and may deepen feelings of distrust and blame among colleagues [2]. Also, frequent absentees are more likely to be dismissed than employees who rarely take sick leave [3,4]. Schaufeli et al. observed that long-term and frequent sickness absence are outcomes of different processes [5].

Frequent sickness absence is defined as taking sick leave three or more times a year [6,7]. Psychological studies of sickness absence provide two theories explaining why some employees frequently report sick [5,8]. The motivational theory suggests that employees, particularly those lacking job satisfaction and organizational commitment, call in sick to escape from or protest against poor work circumstances [7-11]. The behavioural theory states that frequent sickness absence is a coping mechanism to deal with stressful work demands [5,8,12,13]. The ability to cope with work demands depends on an employee's health and psychological resources. The Finnish researchers Ilmarinen and Tuomi have integrated health, resources and coping with work demands in the concept of work ability, that is: 'the ability at present and in the near future of an employee to do his/her work with respect to the work demands, health and mental resources' [14]. Work ability is most commonly measured with the Work Ability Index (WAI) [15].

Several studies have reported that reduced WAI scores increase the risk [16] and duration [17,18] of long-term sickness absence. Alavinia et al. reported that Dutch construction workers with poor work ability had more short (<2 weeks), medium (2–12 weeks) and long-term (>12 weeks) sickness absence episodes than construction workers with good work ability [19]. To our knowledge, there are no other studies that related work ability to the frequency of sickness absence. The aim of this study was to investigate the association between work ability and both frequent and long-term sickness absence. If frequent sickness absence is only driven by motivational processes, then we expect similar work ability scores for frequent absentees and employees who are rarely or never absent due to sickness. Alternatively, frequent absentees who call in sick to cope with and recover from work strain are likely to experience reduced work ability.

Methods

ArboNed is a Dutch national occupational health service (OHS) that provides occupational health care to employees of > 70,000 contracted companies. Besides the work rehabilitation of sick-listed employees, surveillance of work and health is an important OHS task in The Netherlands. Under Dutch law employers must enable their personnel to participate in occupational health surveys every 4 years.

In 2010–2012, we posted a paper occupational health questionnaire to employees working in 73 companies in the industrial (32%), private (19%), public (26%), and non-specified (23%) sectors. The questionnaire contained items on health, work conditions, working environment, and work ability. The Medical Ethics Committee of the University Medical Center Groningen granted ethical clearance for the study (reference M12.116654).

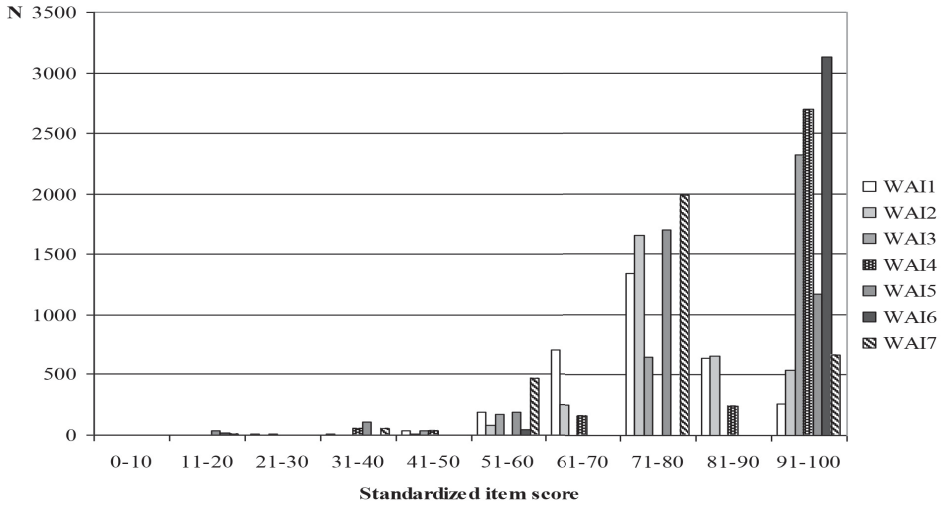
We measured work ability with a short version of the WAI [20] including the dimensions 'current work ability compared with lifetime best', 'work ability in relation to the demands of the job', 'number of physician-diagnosed diseases', 'work impairment due to disease', 'sickness absence in the past year', 'work ability in the forthcoming two years', and 'psychological resources' (Figure 1). The total WAI score is the sum of scores for these dimensions; higher scores representing better work ability [13]. The psychometric properties of the WAI are satisfactory [21,22].

To measure the frequency of sickness absence, the questionnaire asked: '*How often did you report sick in the past 12 months?*' and to measure long-term sickness it asked: '*Have you been absent due to sickness for two or more consecutive weeks in the past 12 months?*'. We used responses to categorize participants into one of three different types of sickness absence [23]:

- frequent sickness absence: three or more short-term (i.e. lasting <2 weeks) episodes in the past 12 months),
- long-term sickness absence: one or more long-term (i.e. lasting 2 weeks or more) episodes in the past 12 months,
- combined sickness absence: three or more episodes in the past 12 months, with at least one episode lasting 2 weeks or more.

Zero absentees and participants with only one or two short-term sickness absence episodes constituted the reference group.

Figure 1. Distribution of work ability scores



The figure shows the distributions of work ability dimensions 'current work ability compared with lifetime best' (WAI1), 'work ability in relation to the demands of the job' (WAI2), 'number of physician-diagnosed diseases' (WAI3), 'work impairment due to disease' (WAI4), 'sickness absence in the past year' (WAI5), 'work ability in the forthcoming two years' (WAI6), and 'psychological resources' (WAI7)

Van den Berg et al. showed that age, body mass index (BMI), leisure-time physical activity, physical workload, mental work demands, and autonomy in work were associated with WAI scores [24]. As these factors are also related to sickness absence, we retrieved the covariates age, self-rated height and weight (for BMI), leisure-time physical activity ('*How often did you become sweaty because of vigorous physical exercise or sports?*' [25]), type of work (manual or non-manual), and work autonomy ('*Can you decide yourself how you do your work?*') from the health questionnaire.

We used IBM SPSS Statistics for Windows (version 20) for the statistical analyses. We standardized WAI dimension scores as a percentage of the maximum dimension score. Standardized WAI dimensions scores ranged between 0 and 100. We included the WAI dimensions as continuous independent variables in a multivariate multinomial regression model, with sickness absence categories as outcome variable and controlled for age, BMI, leisure-time physical activity, type of work, and autonomy. There was no need for multilevel analysis, because clustering at the company level was negligible (<1%). Multinomial regression estimates odds ratios (OR) and related 95% confidence intervals (CI) presented per 10-point increase in standardized WAI

dimension scores. WAI scores have been shown to decline with age, particularly in women [13,26]. We used multiplicative interaction analysis to investigate whether or not age and gender affected associations between work ability and sickness absence.

Results

Of 6682 employees invited to participate, a total of 3660 (55%) completed the health questionnaire. Employer records showed that non-participants were older (mean age 41, standard deviation [SD]=13.5; t-test $P<0.01$) and were employed at their company for longer (mean 9.4, SD=9.2 years; Mann-Whitney $P<0.01$) than participants but worked an equal number of hours per week (mean 37.9, SD=7.9; Mann-Whitney $P=0.77$).

Four hundred and seventy participants (13%) participants did not answer the sickness absence questions. They had higher WAI scores (t-test $P<0.01$) than participants who answered the sickness absence questions. Because non-responses might have been non-random, we did not impute missing sickness absence data, but used the data of 3190 participants for complete case analysis. Of these 3190 participants, 13% (414) reported frequent, 5% (154) long-term, and 3% (109) combined sickness absence (Table 1). Frequent sickness absence was commonest in young and highly educated participants, whereas long-term sickness absence was commonest in older participants of medium education. Women had more frequent and long-term sickness absence than men.

WAI scores were lower for participants with frequent, long-term as well as combined sickness absence and lowest for combined sickness absence, compared with participants in the reference group (Table 2).

The total WAI score was negatively associated with frequent, long-term, and combined sickness absence (Table 3). Interaction analysis showed non-significant *P*-values for the interaction term age*WAI for frequent, long-term and combined absentees, indicating that cross-sectional associations between total WAI scores and sickness absence did not significantly change with age. The interaction term gender*WAI was not significant for frequent, long-term and combined absentees, meaning that cross-sectional associations between WAI and sickness absence did not differ between men and women.

Table 1. Characteristics of study participants (N=3190)

	Reference[a] (N=2513)		Frequent[b] (N=414)		Long-term[c] (N=154)		Combined[d] (N=109)		Analysis
	Mean (SD)	n (%)	Mean (SD)	n (%)	Mean (SD)	n (%)	Mean (SD)	n (%)	
Age	36.2 (10.9)		34.6 (9.9)		38.1 (12.6)		37.4 (10.5)		P=0.002[e]
Gender									
men		1406 (56)		174 (42)		65 (42)		42 (38)	P<0.001[f]
women		1107 (44)		240 (58)		89 (58)		67 (62)	
Education									
low		113 (5)		27 (7)		11 (7)		10 (9)	P<0.001[f]
medium		374 (15)		56 (14)		35 (23)		31 (29)	
high		1972 (80)		313 (79)		104 (69)		65 (61)	
missing		54		18		4		3	
Years employed									
at company	8.0 (7.7)		7.0 (7.1)		9.1 (8.2)		8.0 (7.3)		P=0.002[g]
in present job	4.8 (5.9)		4.3 (5.3)		5.4 (5.5)		4.7 (4.7)		P=0.006[g]
Work hours/week	40.7 (9.2)		38.9 (8.9)		36.3 (9.6)		36.8 (9.3)		P<0.001[g]
Body mass index	24.2 (3.3)		24.3 (3.7)		24.5 (4.2)		25.0 (4.4)		P=0.141[e]
Physical activity									
never		399 (17)		103 (26)		23 (16)		30 (30)	P=0.002[f]
1x per week		786 (34)		129 (32)		53 (38)		30 (30)	
3 x per week		900 (39)		133 (33)		56 (40)		36 (36)	
5x per week		146 (6)		20 (5)		4 (3)		3 (3)	
daily		86 (4)		13 (3)		4 (3)		2 (2)	
missing		196		16		14		8	
Type of work									
manual		33 (2)		6 (2)		4 (4)		7 (9)	P<0.001[f]
non-manual		1704 (98)		259 (98)		101 (96)		69 (91)	
missing		776		149		49		33	
Work autonomy									
never		28 (1)		11 (3)		4 (3)		6 (6)	P=0.003[f]
sometimes		186 (8)		48 (12)		18 (12)		11 (10)	
often		488 (20)		100 (24)		28 (19)		27 (26)	
almost always		1302 (53)		190 (47)		69 (47)		40 (38)	
always		435 (18)		59 (14)		28 (19)		21 (20)	
missing		74		6		7		4	

[a] <3 short-term (i.e. lasting <2 weeks) episodes in the past year; [b] ≥3 short-term (i.e. lasting <2 weeks) episodes in the past year; [c] one or more long-term (i.e. lasting ≥2 weeks) episodes in the past year; [d] ≥3 episodes in the past year of which at least one episode lasting ≥2 weeks; [e] parametric one-way analysis of variance [f] Chi-square test [g] non-parametric Kruskall-Wallis test

Table 2. WAI dimension scores stratified by sickness absence

Work ability dimension	Range	Reference[a] (n=2513) mean (SD)	Frequent[b] (n=414) mean (SD)	Long-term[c] (n=154) mean (SD)	Combined[d] (n=109) mean (SD)
Work ability compared with lifetime best	0 – 10	8.0 (1.0)	7.7 (1.1)	7.6 (1.3)	7.4 (1.4)
Work ability in relation to demands of work	2 – 10	8.5 (0.9)	8.1 (1.0)	8.1 (1.1)	7.9 (1.0)
Number of physician-diagnosed diseases	1 – 7	6.4 (1.0)	6.2 (1.2)	6.0 (1.2)	5.5 (1.3)
Work impairment due to disease	1 – 6	5.8 (0.6)	5.6 (0.9)	5.1 (1.4)	4.7 (1.5)
Sickness absence in the past year	1 – 5	4.4 (0.5)	3.8 (0.6)	2.7 (0.9)	2.4 (0.9)
Work ability in the forthcoming two years	1 – 7	6.9 (0.4)	6.9 (0.8)	6.9 (0.4)	6.5 (1.4)
Psychological resources	1 – 4	3.0 (0.6)	2.9 (0.7)	2.9 (0.7)	2.8 (0.7)
Total WAI	7 – 49	43.2 (2.7)	41.2 (3.4)	39.4 (3.9)	37.2 (5.2)

[a] <3 short-term (i.e. lasting <2 weeks) episodes in the past year; [b] ≥3 short-term (i.e. lasting <2 weeks) episodes in the past year; [c] one or more long-term (i.e. lasting ≥2 weeks) episodes in the past year; [d] ≥3 episodes in the past year of which at least one episode lasting ≥2 weeks

Table 3. Multivariate analysis of work ability and sickness absence

	Frequent[a] (n=414) OR (95% CI)	Long-tem[b] (n=154) OR (95% CI)	Combined[c] (n=109) OR (95% CI)
WAI	0.85 (0.82–0.88)***	0.79 (0.75–0.82)***	0.74 (0.71–0.77)***
Age	1.02 (0.97–1.06)	1.00 (0.97–1.02)	0.97 (0.94–1.00)
Gender			
men	0.75 (0.56–1.02)	1.00 (0.62–1.60)	0.83 (0.46–1.90)
women	reference	reference	reference
Body mass index	1.01 (0.96–1.05)	0.99 (0.91–1.07)	1.04 (0.96–1.13)
Physical activity	1.00 (0.89–1.13)	1.02 (0.89–1.48)	1.07 (0.89–1.43)
Type of work			
manual	1.14 (0.30–3.24)	1.74 (0.28–5.42)	3.66 (0.22–7.74)
non-manual	reference	reference	reference
Work autonomy	0.88 (0.75–1.04)	0.99 (0.75–1.31)	1.01 (0.79–1.50)

*The table shows odds ratios (OR) and related 95% confidence intervals (CI) of a multivariate multinomial regression model including the total WAI score together with age, gender, BMI, leisure-time physical activity, type of work and work autonomy; the reference group comprised 2513 participants with 0–2 short-term (<2 weeks) sickness absence episodes; P<0.05, ** P<0.01, and *** P<0.001.*

[a] ≥3 short-term (i.e. lasting <2 weeks) episodes in the past year; [b] one or more long-term (i.e. lasting ≥2 weeks) episodes in the past year; [c] ≥3 episodes in the past year of which at least one episode lasting ≥2 weeks

When investigating the associations between WAI dimensions and sickness absence, we excluded the WAI dimension 'sickness absence in the past year' because it was highly correlated (Pearson correlation coefficient *r*=0.80) with the outcome variable. Of the remaining WAI dimensions, 'work impairment due to disease' was associated with long-term and combined sickness absence and to a lesser extent, frequent sickness absence (Table 4). 'Work ability in relation to the demands of the job' was associated with frequent sickness absence and 'number of physician-diagnosed diseases' with combined sickness absence.

Table 4. Work ability dimensions and sickness absence

Work ability dimension	Frequent[a] (n=414)	Long-term[b] (n=154)	Combined[c] (n=109)
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Work ability compared with lifetime best	0.86 (0.76–1.00)	0.84 (0.69–1.03)	0.88 (0.71–1.09)
Work ability in relation to demands of work	0.79 (0.67–0.92)***	0.90 (0.71–1.13)	0.85 (0.66–1.10)
Number of physician-diagnosed diseases	0.98 (0.89–1.08)	0.97 (0.85–1.11)	0.84 (0.73–0.96)**
Work impairment due to disease	0.84 (0.76–0.92)**	0.67 (0.60–0.75)***	0.66 (0.59–0.75)***
Work ability in the forthcoming two years	0.94 (0.81–1.10)	0.83 (0.59–1.15)	0.85 (0.71–1.02)
Psychological resources	0.97 (0.88–1.07)	0.99 (0.85–1.16)	1.03 (0.86–1.23)

The table shows odds ratios (OR) and related 95% confidence intervals (CI) per 10-point increase in dimension scores, adjusted for age, gender, BMI, leisure-time physical activity, type of work, and work autonomy, compared to 2513 participants with 0–2 short-term (<2 weeks) sickness absence episodes; the WAI dimension 'Sickness absence in the past year' was excluded from analysis because of its high correlation with the outcome.

*[a] ≥3 short-term (i.e. lasting <2 weeks) episodes in the past year; [b] one or more long-term (i.e. lasting ≥2 weeks) episodes in the past year; [c] ≥3 episodes in the past year of which at least one episode lasting ≥2 weeks, ** P<0.01, and *** P<0.001*

Discussion

This study found that WAI scores were associated with frequent, long-term and combined sickness absence. Age and gender did not affect the cross-sectional associations between work ability and sickness absence. The WAI dimension 'work impairment due to disease' was associated with all types of sickness absence. 'Work ability in relation to the demands of the job' was associated with frequent sickness absence and 'number of physician-diagnosed diseases' with combined sickness absence.

A strength of our study is the heterogeneous sample of employees from companies of different economic sectors, although most employees in the private sector worked in financial institutions and most employees in the public sector worked in healthcare. A weakness of the study is its cross-sectional design, which precludes conclusions on prospective associations between work ability and sickness absence. Furthermore, the study relied on employee-reported sickness absence, which may be recall-biased. Recorded sickness absence data were available for a subsample of 1748 participants. We used this to check the validity of self-reported sickness absence. Seventy-eight percent of the participants with recorded frequent sickness absence reported frequent sickness absence and 75% of the participants with recorded long-term sickness absence reported long-term sickness absence. Although reasonable for occupational health surveys, the 55% response rate is another weakness of the study.

In our study, WAI dimension scores were up to 24% higher than those reported by Van den Berg et al. for a sample of 10,542 employees working in 49 companies in The Netherlands [27]. Possibly, participants were healthier than non-participants, a phenomenon known as healthy volunteer bias [28]. This may have under-estimated the associations between work ability and sickness absence. Responses to self-administered questionnaires are driven by personal dispositions, experiences and interpretations [29]. Dissatisfied participants might be pessimistic about their work ability, which could have caused negative affectivity bias [30]. However, negative affectivity bias was unlikely, because we found higher rather than lower work ability compared with previously reported scores [27]. Thirteen percent of the participants had missing data on the sickness absence questions and their work ability scores were higher than those of participants with complete data. Zero absentees may not have answered the sickness absence items, which could have under-estimated associations between work ability and sickness absence.

Our results confirm the associations between work ability and long-term sickness absence [15-19] and add that work ability is also associated with frequent sickness absence. Work impairment

due to disease was significantly associated with frequent sickness absence, while psychological resources were not. This suggests that frequent sickness absence is more than a psychological process driven by motivational factors. The association between frequent sickness absence and work ability in relation to the demands of work supports the behavioural hypothesis that frequent absentees take sick leave to recover from the strain of work [12]. If frequent absentees have problems coping with the demands of work, then frequent sickness absence could be regarded as an indicator of work-related health problems. Koopmans et al. showed that frequent absentees are at risk of future long-term sickness absence [23].

We conclude that work ability scores are cross-sectionally associated with frequent short-term as well as long-term sickness absence. Frequent sickness absence has been studied from a psychological perspective. Our findings warrant prospective studies to investigate medical risk factors and mechanisms underlying frequent sickness absence. Additionally, cohort studies could investigate which frequent absentees are at risk of becoming long-term absentees.

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