# Influence of work-related characteristics and work ability on changing employer or leaving the profession among nursing staff

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**Influence of work-related characteristics and work ability on changing employer or leaving the profession among nursing staff**

*Aim* To investigate how work-related characteristics and work ability influence nursing staff decisions to change employer or leave the profession.
*Background* Previous cross-sectional studies have indicated that decreased work ability and unfavourable work-related characteristics are important determinants for the intention to leave the profession among nursing staff.
*Methods* A 1-year longitudinal study, using data from the European Nurses' Early Exit Study. The study population consisted of 9927 (66%) members of the eligible nursing staff of which 345 left their current employer. Work-related characteristics, work ability and employment status were assessed by questionnaires.
*Results* Nursing staff with a low work ability were more likely to either change employer or leave the profession. Among nursing staff with a low work ability the risk of changing employer increased significantly with unfavourable work-related characteristics. However, among nursing staff with a good work ability the risk of changing employer barely changed with unfavourable work-related characteristics.
*Conclusion* The negative effects of decreased work ability on changing employer and leaving the profession are partly counterbalanced by favourable psychological and physical work-related characteristics.
*Implications for nursing management* Managers should implement strategies that focus on promoting the work ability of nursing staff in combination with improving work-related characteristics in order to prevent unnecessary changes of employment.

*Keywords*: longitudinal design, nursing staff, turnover, work ability index, work characteristics

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## Introduction

Nursing shortage caused by an ageing workforce and nursing staff leaving the profession early is a major problem within the health-care sector (Sjogren *et al.* 2005, Hayes *et al.* 2006, Friis *et al.* 2007). This shortage also has a negative effect on the quality of care provided (Aiken *et al.* 2002, Hayes *et al.* 2006), and is associated with high costs owing to replacement of personnel and loss in productivity (Contino 2002). Therefore, a better understanding is required of why nursing staff leave their current institution to work for another health-care institution or leave the profession entirely (Derycke *et al.* 2012).

## Literature review

### Work ability, work-related characteristics and employment

In recent years the concept of work ability has received increasing interest with regard to exploring the relationship between the work situation and intention to leave the nursing profession (Camerino *et al.* 2006, 2008). Work ability refers to the self-perceived degree to which a worker, given his or her health, is physically and mentally able to cope with the mental and physical demands of his or her job. In recent years, promoting work ability has been considered a key factor in prolonging a productive working life (Ilmarinen & Tuomi 2004).

Work ability has been found to predict early exit from paid employment (Camerino *et al.* 2008, Alavinia *et al.* 2009c, Sell 2009) and long-term sickness absence (Sell 2009). For nursing staff, a decreased work ability is found to be strongly associated with intention to leave both the ward and the organisation (Derycke *et al.* 2012). Several studies have shown that a decreased work ability is related to numerous work-related characteristics: high work demands, lack of job control, effort-reward imbalance and high physical work demands (Alavinia *et al.* 2009a, Van den Berg *et al.* 2009, Bethge & Radoschewski 2010). Moreover, these work-related characteristics also play a significant role in early exit from paid employment in a wide range of occupations (Van den Berg *et al.* 2010). Previous studies show that unfavourable work-related characteristics are related to nursing staff leaving nursing care (Fochsen *et al.* 2005) and the profession entirely (Estryn-Behar *et al.* 2010). Furthermore, research has shown that nurses with a decreased work ability who had experienced high support by their colleagues reported a lower intention to leave the current ward (Derycke *et al.* 2012).

### Theoretical models

The work-related characteristics described above are constructs incorporated into two important models in occupational health psychology: the Job–Demand–Control–Support (JDCS) model and the Effort–Reward Imbalance (ERI) model. The JDCS model was developed by Karasek (1979) and later extended by Johnson *et al.* (1989), and focuses on the relation between job demands, perceived control at work and social support (Van der Doef & Maes 1999). The construct of job demands refers to the workload perceived by the worker, perceived control in timing and planning of one's work activities, and social support experienced from colleagues and supervisors (Van der Doef & Maes 1999). The ERI model was developed by Siegrist (1996), and emphasizes that there should be a balance between what an employee gives (effort) and receives (reward) (Siegrist *et al.* 2004). Here, efforts refer to the demanding aspects of the work environment, while rewards include self-perceived financial rewards, rewards in esteem and rewards related to promotion prospects and job security (Siegrist *et al.* 2004). The JDCS model focuses on job demands whereas the ERI puts its emphasis on rewards (De Jonge *et al.* 2000).

## Purpose of research

It has been proposed by Chen *et al.* (2008) and Hayes *et al.* (2011) that there is a need to investigate the determinants of actual turnover in a job instead of intention to leave. The relationship between work-related characteristics, actual turnover and the retention of nursing staff is still poorly understood (Hayes *et al.* 2006). Furthermore, it is unclear how work-related characteristics, work ability and leaving the profession are interrelated. Poor psychosocial work factors may be important determinants for exiting the profession, especially among nursing staff with decreased work ability. This study aims: (1) to determine the role of decreased work ability and poor work-related characteristics in changing employer and leaving the profession, and (2) to investigate interactions between work-related characteristics and work ability and their influence on changing employer and leaving the profession.

## Methods

### Study population

The study population consists of participants in the Nurses' Early Exit Study (NEXT-Study). The NEXT-Study is a 1-year longitudinal study aimed at investigating premature departure (i.e. leaving before the statutory retirement age) of nurses from health care institutions. Nursing staff of different qualification levels (registered nursing in non-managerial and managerial positions and nursing aids) were eligible to participate. Data were collected in 10 European countries (Belgium, Finland, France, Germany, UK, Italy, the Netherlands, Norway, Poland and Slovakia) between February 2002 and June 2005 (Hasselhorn *et al.* 2005).

### Methodology

Data were collected by questionnaires. The baseline questionnaire (Q0) was sent out between October 2002 and June 2003 to members of the nursing staff within 623 participating health-care institutions (Hasselhorn *et al.* 2005). In the subsequent year, those who had left the institution were asked to fill out a questionnaire (Qex) investigating reasons for leaving. Members of the nursing staff who stayed in the institution received a follow-up questionnaire (Q12) after 12 months. Both Qex and Q12 were sent to all nursing staff, except those from the UK and Norway. A detailed description of the study design and responses per country have been published previously (Hasselhorn *et al.* 2005).

### Sample of this study

The population selected for the current study were members of the nursing staff who (1) filled out Q0 and Q12 or Q0 and Qex, (2) completed the work ability index questionnaire at baseline, and (3) were aged 30 years or older. Nursing staff younger than 30 years were excluded from the analyses because of the high prevalence of leaving their institution for family or education purposes, irrespective of work characteristics or their work ability. Nursing staff who left the institution owing to retirement ($n$ = 42) were also excluded. Eligible members of nursing staff came from Belgium, Denmark, Finland, France, Italy, the Netherlands, Poland and Slovakia. In total, 34 587 (56%) individuals from these countries responded to Q0. Of these, 15 099 (44%) also responded to either the Q12 ($n$ = 14 347) or Qex ($n$ = 752). Within this group, 9927 (66%) met the inclusion criteria of having a complete work ability index and an age of 30 years or older. In this study population, 9582 were still working in the same institution 12 months later and 345 had left the institution. A detailed description of the responses per country has been published previously (Hasselhorn *et al.* 2005).

### Instruments

Information regarding the core concepts of this study (i.e. work ability, psychological and physical work-related characteristics, and individual characteristics) were collected in Q0. Work status was assessed by means of information from Q12 and Qex. These questionnaires were translated for each country by means of the translation–back-translation methodology (Hambleton 1994).

*Changing health-care institution or leaving the profession*

Nursing staff leaving their institution were asked what their current employment status was and if they had a new job whether this new job was within nursing. Based on these questions nursing staff leaving their institution were divided into two groups: (1) nursing staff that changed employer within the profession, and (2) nursing staff that left the profession. The first group consisted solely of nursing staff who switched health-care institution, but who remained working as a nurse or nursing aid. The second group consisted of nursing staff that had started a new job outside the profession, those who were out of paid employment and were looking for a new job, and those who were out of paid employment but were not seeking a new job. Due to the data collection protocol, it was not possible to define change of job within the same institution.

*Work ability*

Work ability assesses the self-perceived capability to fulfil the mental and physical demands of the job and is measured by the short version of the Work Ability Index (WAI), which has been shown to be a valid and reliable instrument (Tuomi *et al.* 1998, Ilmarinen & Tuomi 2004). The WAI is an assessment of the physical and mental demands of an individual in relation to his of her work and is used across a large range of occupations and economic activities (Van den Berg *et al.* 2009). It consists of nine questions and comprises seven dimensions: general work ability, work ability in relation to physical and mental demands,

diagnosed diseases, impairment caused by illness, absence through sickness, prognoses of work ability, and psychological resources. The WAI is derived as the sum of the rating on these seven dimensions. The range of the summative index is 7–49 and categorizes work ability into poor (7–27), moderate (28–36), good (37–43), or excellent (44–49). A decreased work ability is defined as a WAI score lower than 37 (poor and moderate) (Tuomi *et al.* 1998).

*Psychosocial work-related characteristics*

Psychosocial work-related characteristics included concepts incorporated by the JDCS model (job control, work demands, social support) and the ERI model (effort, rewards). Job control refers to a person's ability to control timing and planning of his or her work activities and was measured with eight items, including four items derived from the Copenhagen Psychosocial Questionnaire (COPSOQ) (Kristensen 2000) and four modified items based on the Swedish version of the Demand–Control questionnaire (Theorell *et al.* 1988). Questions were asked about the influence on which work tasks to fulfil, work pace, whether the work requires taking initiative, and whether the work was varied (Cronbach's $\alpha = 0.74$). Work demands refer to the work load perceived by the worker and was measured by three items derived from the COPSOQ (Kristensen 2000), including questions about whether a nurse had to work very fast and whether he/she has enough time to complete the tasks assigned (Cronbach's $\alpha = 0.66$). Social support refers to the extent to which employees feel supported at work by colleagues and supervisor and is measured by eight items on social support from colleagues and supervisor (Cronbach's $\alpha = 0.80$) (Van der Heijden 2003). For all items a five-point scale was used with the following ratings: 'to a very small extent', 'not very much', 'somewhat', 'to some extent' and 'to a large extent'. Sum scores were calculated for all constructs and the lowest quartile was defined as an unfavourable work-related characteristic.

Efforts and rewards were measured by means of the ERI questionnaire by Siegrist *et al.* (2004). Efforts refers to the demanding aspects of the work environment while rewards includes self-perceived financial reward, reward in esteem, and reward related to promotion prospects and job security gained by the job (Siegrist *et al.* 2004). The questionnaire consists of six items measuring 'efforts' (Cronbach's $\alpha = 0.78$) and 11 items measuring 'rewards' (Cronbach's $\alpha = 0.88$). For all items a five-point scale was used with the following: ratings 'no', 'yes and this distresses me not at all', 'yes and this distresses me moderately', 'yes and this distresses me considerably', and 'yes and this distresses me very much'. Sum scores were calculated per construct. A sum score within the highest quartile (efforts) or lowest quartile (rewards) was defined as an unfavourable work-related characteristic.

*Physical work-related characteristics*

Physical work-related characteristics were measured using a questionnaire specifically developed for the NEXT-study consisting of typical nursing activities (Kümmerling *et al.* 2003). Its content validity was measured multiple times by experts and indicated a high internal consistency of the scale with Cronbach's alpha values ranging from 0.79 to 0.91 (Kümmerling *et al.* 2003, Simon *et al.* 2008). Three dimensions were formed: (1) five items related to manual patient handling activities (bedding and positioning, transferring and carrying, lifting, pushing, and mobilizing patients) (Cronbach's $\alpha = 0.86$), (2) three items related to activities involving personal care of patients (clothing patients, helping with feeding patients, and making beds) (Cronbach's $\alpha = 0.77$), and (3) one item related to awkward postures. For all items a four-point scale was used with the ratings: '0–1 times a day', '2–5 times a day', '6–10 times a day', and 'more than 10 times a day '. Sum scores were calculated for all constructs and the highest quartile was defined as an unfavourable work-related characteristic.

*Individual characteristics*

Individual characteristics included gender, age, and educational level. Age was categorized into 30–39 years, 40–49 years, and 50–64 years. Educational level was divided into low to intermediate educational level (nursing staff without training, assistant old people's nurses, and nursing aids/assistant paediatric nurses) and high educational level (qualified nurses, specialist nurses, old people's nurses, paediatric nurses and midwifes).

## Data analysis

Descriptive statistics were used for general characteristics of the study population. Logistic regression analyses were used to evaluate determinants of the dependent variables 'changing employer within the profession' and 'leaving the profession'. In univariate regression analyses individual, psychosocial and physical work-related characteristics, and work ability were independent variables. The odds ratio (OR) was estimated as the measure of association with a

corresponding 95% confidence interval (95% CI). Variables with a $P < 0.20$ were considered for inclusion in the multivariate analysis. Subsequently, a backward selection procedure was used to retain variables with a statistically significant association ($P < 0.05$) in the multivariate model.

The Relative Risk due to Interaction (RERI) was calculated to characterize the potential interaction between decreased work ability and poor work-related characteristics on both outcome measures (Hosmer & Lemeshow 1992). Interactions were estimated for the work-related characteristics with a $P < 0.20$ in the univariate regression analyses. An interaction was considered to be present when the combined association of both factors (decreased work ability and unfavourable work-related characteristics) was larger than the sum of the independent associations. Interaction terms were defined by product terms of dichotomized conditions, resulting in four exposure conditions, with a combination of good work ability and favourable work-related characteristics as the reference group. The RERI was calculated with the formula: RERI = RR (Decreased WAI and unfavourable work-related characteristics) – RR (Decreased WAI and favourable work-related characteristics) – RR (Good work ability and unfavourable work-related characteristics) + 1 (Andersson *et al.* 2005), where RR stands for relative risk. In order to calculate the RERI from logistic regression analyses, we assumed that the OR could be used as a fair approximation of the RR. The interaction term was considered to be statistically significant when the value zero was outside the 95% CI (Van den Berg *et al.* 2011).

All analyses were carried out using the Statistical Package for Social Sciences PASW (Predictive Analysis SoftWare) version 17.0.2 for Windows (SPSS Inc, Chicago, IL, USA).

## Results

### Demographics of the study population

The study participants were mainly female (88.7%) and ranged in age from 30 to 64 years with a mean of 42.1 years (SD = 0.32) years. Within 12 months of the baseline measurement, 3.6% of the respondents left their current employer; of these 60.0% had found a new job within the profession. Nursing staff leaving the profession more often reported decreased work ability (37.0%) in comparison with nursing staff who remained employed at their employer (24.2%) or changed employer within the profession (28.5%) (see Table 1). Nursing staff leaving the profession experienced more often poor work-related characteristics compared with colleagues who left their employer but remained employed as a nurse or nursing aid, or still

**Table 1**
Individual characteristics, work-related characteristics and work ability among 9927 members of nursing staff in Europe at entry in a longitudinal study with 1 year follow-up

| | *Remained in current institution (n = 9582)* | | *Changed employer within the profession (n = 207)* | | *Left the profession (n = 138)* | |
|---|---|---|---|---|---|---|
| | *n* | *%* | *n* | *%* | *n* | *%* |
| Demographics | | | | | | |
| Age (years) | | | | | | |
| 30–39 | 3895 | 40.7 | 103 | 49.8 | 67 | 48.6 |
| 40–49 | 3748 | 39.1 | 76 | 36.7 | 37 | 26.8 |
| 50–64 | 1939 | 20.2 | 28 | 13.5 | 34 | 24.6 |
| Female worker | 8484 | 88.6 | 187 | 90.8 | 133 | 96.4 |
| Higher education | 7613 | 82.5 | 182 | 90.1 | 98 | 71.5 |
| Psychosocial work characteristics | | | | | | |
| Low job control | 2305 | 24.3 | 58 | 28.2 | 39 | 28.5 |
| High work demands | 3610 | 37.7 | 86 | 41.7 | 61 | 44.5 |
| Low social support | 2758 | 28.8 | 66 | 32.0 | 47 | 34.3 |
| High efforts | 2873 | 30.0 | 73 | 36.0 | 49 | 36.3 |
| Low rewards | 2258 | 25.2 | 47 | 26.9 | 29 | 27.6 |
| Physical work characteristics | | | | | | |
| Frequent manual patient handling activities | 2680 | 30.7 | 71 | 36.2 | 42 | 32.3 |
| Frequent patient care activities | 2325 | 26.7 | 58 | 29.9 | 34 | 26.0 |
| Frequent awkward postures | 3061 | 34.8 | 80 | 41.5 | 53 | 40.5 |
| Work ability | | | | | | |
| Poor/moderate | 2320 | 24.2 | 59 | 28.5 | 51 | 37.0 |

worked for the same employer 1 year later (see Table 1).

All psychosocial and physical work-related characteristics, except social support and manual patient handling, were correlated. Correlations ranged from Spearman rank coefficient of $\theta = 0.04$ for patient care activities and social support to $\theta = 0.75$ for manual patient handling activities and patient care activities. Nursing staff engaged in physical work activities were more likely to report unfavourable work-related characteristics.

## Determinants of changing employer and leaving the profession

Reduced work ability was associated with changing employer within the profession (OR = 1.39, 95% CI 1.01–1.93) and leaving the profession (OR = 1.71, 95% CI 1.18–2.47) (see Table 2). Women were more likely to leave the profession than men (OR = 3.10, 95% CI 1.26–7.61), and nursing staff with a higher educational level were more likely to change employer within the profession (OR = 2.07, 95% CI 1.24–3.48) (see Table 2). The analysis stratified by educational level yielded a stronger association between all physical work-related characteristics and both exit pathways for nursing aids compared with registered nurses (data not shown).

Unfavourable psychosocial work-related characteristics and frequently working in awkward postures were statistically significantly associated with a poor or moderate work ability, with associations ranging from OR = 1.16 (95% CI 1.03–1.31) for high work demands to OR = 2.17 (95% CI 1.91–2.46) for high efforts. Among the seven dimensions of the work ability index, only being impaired at work because of illness was statistically significantly associated with leaving the profession (OR = 1.81, 95% CI 1.26–2.78).

### *Interaction between work ability and work-related characteristics*

For changing employer within the profession the interaction effects of decreased work ability and high efforts (RERI = 0.94, 95% CI 0.16–1.73), frequent manual patient handling activities (RERI = 1.14, 95% CI 0.24–2.05) and frequently being in awkward postures (RERI = 1.70, 95% CI 0.92–2.49) were statistically significantly stronger than the single effects (Table 3).

**Table 2**
Univariate and multivariate relations of individual characteristics, work-related characteristics and work ability with changing job within the profession ($n$ = 9789) and leaving the profession ($n$ = 9720)

| | *Changed employer within the profession ($n$ = 207)* | | | | *Leaving the profession ($n$ = 138)* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Univariate ($n$ = 9789)* | | *Multivariate ($n$ = 9789)* | | *Univariate ($n$ = 9720)* | | *Multivariate ($n$ = 9720)* | |
| | *OR* | *95% CI* | *OR* | *95% CI* | *OR* | *95% CI* | *OR* | *95% CI* |
| Demographics | | | | | | | | |
| Age | | | | | | | | |
| 30–39 | 1.30[a] | 0.97–1.76 | 1.18 | 0.86–1.62 | 1.74* | 1.16–2.61 | 1.83* | 1.20–2.78 |
| 40–49 (ref) | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 50–64 | 0.71[a] | 0.46–1.10 | 0.65 | 0.41–1.05 | 1.78* | 1.11–2.84 | 1.56 | 0.94–2.58 |
| Female worker | 1.27 | 0.79–2.05 | | | 3.43* | 1.40–8.40 | 3.10* | 1.26–7.61 |
| Higher education | 1.93* | 1.21–3.07 | 2.07* | 1.24–3.48 | 1.17 | 0.72–1.87 | | |
| Psychosocial work characteristics | | | | | | | | |
| Low job control | 1.22[a] | 0.90–1.66 | | | 1.24 | 0.85–1.81 | | |
| High work demands | 1.18 | 0.89–1.56 | | | 1.32[a] | 0.94–1.85 | | |
| Low social support | 1.15 | 0.85–1.54 | | | 1.27[a] | 0.89–1.81 | | |
| High efforts | 1.29[a] | 0.96–1.72 | | | 1.31[a] | 0.92–1.86 | | |
| Low rewards | 1.09 | 0.78–1.53 | | | 1.13 | 0.74–1.74 | | |
| Physical work characteristics | | | | | | | | |
| Frequent manual patient handling activities | 1.28[a] | 0.96–1.72 | | | 1.08 | 0.75–1.56 | | |
| Frequent patient care activities | 1.17 | 0.86–1.60 | | | 0.96 | 0.65–1.43 | | |
| Frequent awkward postures | 1.32[a] | 0.99–1.77 | | | 1.27[a] | 0.89–1.81 | | |
| Work ability | | | | | | | | |
| Poor work ability | 1.25[a] | 0.92–1.69 | 1.39* | 1.01–1.93 | 1.84* | 1.30–2.60 | 1.71* | 1.18–2.47 |

95% CI, 95% confidence interval; OR, odds ratio.
[a]$P < 0.20$, considered for inclusion in multivariate analysis.
*$P < 0.05$.

**Table 3**
Interactions between the influence of work ability and work-related characteristics on changing employer within the profession

| | *Stay (n)* | *Change (n)* | *OR* | *95% CI* | *RERI* | *95% CI* |
|---|---|---|---|---|---|---|
| Model 1: Work ability and efforts† | | | | | | |
| Good work ability and low efforts | 5426 | 110 | 1.00 | | | |
| Good work ability and high efforts | 1752 | 34 | 0.97 | 0.65–1.44 | 0.94* | 0.16–1.73 |
| Decreased work ability and low efforts | 1164 | 20 | 0.94 | 0.58–1.52 | | |
| Decreased work ability and high efforts | 1121 | 39 | 1.82* | 1.25–2.65 | | |
| Model 2: Work ability and manual patient handling activities† | | | | | | |
| Good work ability and infrequent manual patient handling activities | 4702 | 99 | 1.00 | | | |
| Good work ability and frequent manual patient handling activities | 1898 | 39 | 0.99 | 0.68–1.44 | 1.14* | 0.24–2.05 |
| Decreased work ability and infrequent manual patient handling activities | 1354 | 26 | 0.98 | 0.63–1.54 | | |
| Decreased work ability and frequent manual patient handling activities | 782 | 32 | 2.11* | 1.40–3.19 | | |
| Model 3: Work ability and awkward posture† | | | | | | |
| Good work ability and infrequent awkward postures | 4586 | 99 | 1.00 | | | |
| Good work ability and frequent awkward postures | 2054 | 37 | 0.83 | 0.56–1.22 | 1.70* | 0.92–2.49 |
| Decreased work ability and infrequent awkward postures | 1137 | 14 | 0.60 | 0.33–1.07 | | |
| Decreased work ability and frequent awkward postures | 1007 | 43 | 2.12* | 1.47–2.49 | | |

95% CI, 95% confidence interval; OR, odds ratio; RERI, relative risk due to interaction.
Data adjusted for gender, age, and educational level.
*$P < 0.05$.
†Data incomplete on work-related characteristics.

**Table 4**
Interaction between the influence of work ability and work-related characteristics on leaving the profession

| | *Stay (n)* | *Leave (n)* | *OR* | *95% CI* | *RERI* | *95% CI* |
|---|---|---|---|---|---|---|
| Model 1: Work ability and awkward postures† | | | | | | |
| Good work ability and infrequent awkward postures | 4586 | 59 | 1.00 | | | |
| Good work ability and frequent awkward postures | 2054 | 26 | 0.96 | 0.60–1.55 | 1.02 | −0.04–2.09 |
| Decreased work ability and infrequent awkward postures | 1137 | 19 | 1.10 | 0.62–1.96 | | |
| Decreased work ability and frequent awkward postures | 1007 | 27 | 2.09* | 1.30–3.35 | | |

95% CI, 95% confidence interval; OR, odds ratio; RERI, relative risk due to interaction.
Data adjusted for gender, age, and educational level.
*$P < 0.05$.
†Data incomplete on work-related characteristics.

Among nursing staff with decreased work ability, the occurrence of high effort increased the risk of changing employer within the profession by 93.6%; frequently performing manual patient handling activities increased the risk by 115.3% and frequently working in awkward postures increased the risk by 253.3%. For nursing staff with good or excellent work ability, the occurrence of high effort or frequently performing manual patient handling activities hardly changed the risk of changing employer within the profession. The potential interaction between decreased work ability and low job control (RERI = 0.23, 95% CI –2.13–2.59) on changing employer within the profession was not statistically significant.

For leaving the profession, the interaction effect of decreased work ability and frequently having to work in awkward postures was not statistically significant (RERI = 1.02, 95% CI –0.04–2.09) (Table 4). Among nursing staff with a decreased work ability, frequently working in awkward postures increased the likelihood of leaving the profession by 90.0%. The interactions between decreased work ability and high effort (RERI = 0.31, 95% CI –0.89–1.50), low social support (RERI = 0.38, 95% CI –0.86–1.63), and high demands (RERI = 0.36, 95% CI –0.85–1.57) were not statistically significant. The presence of these unfavourable work-related characteristics among nursing staff with a decreased work ability increased the probability of leaving the profession by 24.0% for high effort, 32.3% for high work demands and 35.2% for low social support. Among nursing staff with good or excellent work ability these work-related characteristics increased the likelihood of leaving the profession by 9.0, 18.0 and 17.0%, respectively.

## Discussion

Nursing staff with a decreased work ability were more likely to change employer within the profession or to leave the profession altogether. Considerable interactions were observed whereby nursing staff with decreased work ability, and high effort, manual patient handling activities, or working in awkward postures had an increased likelihood of changing employer within the profession. Employee retention in health care can be counterbalanced by addressing nursing staffs' work ability as well as their psychosocial and physical work-related characteristics.

A strength of this study is the use of actual turnover behaviour of nursing staff between institutions within the profession rather than using intention to leave. Intention to leave the current profession is frequently used as a proxy for actual job change because it is supposed to precede actual leaving (Griffeth *et al.* 2000) and to be the final result after first switching ward and organisation (Morrell 2005). In a cross-sectional analysis of the NEXT study decreased work ability was associated with the intention to leave nursing (Camerino *et al.* 2006). This is corroborated in this longitudinal study whereby decreased work ability predicted both change of employer within the profession as well as leaving the profession. This relationship between work ability and changing institution within the profession became stronger when age and education were taken into account. Previous studies have also reported that younger nursing staff and those with a higher educational level were more likely to leave their employer (Barron & West 2005, Hayes *et al.* 2006): both can be the result of seeking career advancement by these nurses (Hayes *et al.* 2006).

Previously, it was found that the first dimension of the WAI, general work ability, could be used as a simple indicator for a more comprehensive measurement of work ability (Ahlstrom *et al.* 2010). However, in our study, this first dimension was not statistically significantly associated with changing employer within the profession or leaving the profession. We observed that only the fourth dimension, being impaired in executing work tasks because of illnesses, was associated with leaving the profession. Alavinia *et al.* (2009b) have also reported the importance of this dimension in relation with productivity loss. Even when employees returned in the same type of job, their productivity was likely to be reduced (Alavinia *et al.* 2009b).

In agreement with previous studies, a relation was found between physical and psychosocial work-related characteristics and work ability (Alavinia *et al.* 2007, 2009a, Van den Berg *et al.* 2009). In a review Hayes *et al.* (2006) proposed that both the JDCS model (Karasek 1979, Johnson *et al.* 1989) and the ERI model (Siegrist 1996) incorporate psychosocial characteristics of work that may adversely contribute to turnover among nursing staff. Lavoie-Tremblay *et al.* (2008) reported that among newly registered nurses lack of social support and effort/reward imbalance were associated with the intention to leave the current employer. Moreover, an effort/reward imbalance, high psychological work demands, and elevated job strain were found to be associated with intention to leave the nursing profession (Lavoie-Tremblay *et al.* 2008). Stordeur and D'hoore (2007) have shown that hospitals with a low turnover were also the hospitals where nursing staff had better work ability, less effort/reward imbalance, and a lower exposure to physically demanding tasks. In the current study, physical and psychosocial work-related characteristics showed modest and non-significant associations with both pathways of leaving the former health-care institution. Chen *et al.* (2008) suggested that among registered nurses their actual leaving might be influenced more by the external labour market than by intention to leave the institution. However, the combination of decreased work ability and poor work characteristics increase the likelihood of changing employer or leaving the profession, with a maximum of 253% while among nursing staff with good or excellent work ability these work-related characteristics hardly had an effect on the likelihood of leaving the current health-care institution. Hence, nursing staff with decreased work ability seem to be more susceptible to the potential consequences of strenuous work characteristics. It might be expected that the negative effects of decreased work ability on job retention can be partly counterbalanced by improving work characteristics.

## Limitations of the study

A strength of this study is the longitudinal design. However, the relatively short time-span between the baseline and follow-up measurement for leaving the employer or the profession as an outcome is a limitation. Selecting the appropriate time interval is always a complicated decision when performing a longitudinal study (Kessler & Greenberg 1981, Frese & Zapf 1988). A longer follow-up period with repeated measurements would be needed to provide more specific information about the stability of the reported associations (Taris & Kompier 2003, De Lange *et al.*

2006). Secondly, because of the small numbers country-specific or stratified analyses were not feasible. Adjustment for country did not affect the results presented in the current study. Some countries participating in the baseline questionnaire could not provide follow-up information for members of the nursing staff that had left and therefore could not be included in the analyses. The nursing staff group leaving the profession was very heterogeneous, with nurses seeking a new career, taking a time because of a situation at home or participating in educational programmes. Given this fact, nursing staff might re-enter the profession in the future when, for example, their children were older or when their education was completed. Moreover, because of the data collection protocol it was not possible to define a change of job within the same health-care institution. This could have led to an underestimation of the members of the nursing staff leaving their current position. Finally, all measurements were based on self-reports that could have caused reporting bias on baseline work-related characteristics and work ability.

## Conclusion

This study showed that decreased work ability is an important determinant of changing institution within the nursing profession and of leaving the nursing profession within 1 year. Policies focusing on employee retention in health care, – a key challenge in most organisations today – must address the negative effects of decreased work ability by improvements in both the psychosocial and physical work-related characteristics.

## Implications for nursing management

Work ability was found to predict nursing staff leaving the current organisation and the profession entirely. Therefore, health-care management should focus on improving and maintaining good work ability. Furthermore, because of the potential buffer effect of favourable psychosocial and physical work-related characteristics, preventive interventions should also be focused on the promotion of a favourable psychosocial and physical work environment. In particular, efforts experienced by the nursing staff should be addressed in addition to the physical aspects of their job.

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## Ethical approval

Ethical approval was obtained in 2001 by the ethical committee of the University of Wuppertal, Germany.

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