

# Low-perceived work ability, ageing and intention to leave nursing: a comparison among 10 European countries

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**Low-perceived work ability, ageing and intention to leave nursing: a comparison among 10 European countries**

**Aim.** This paper reports a study exploring nurses' perceived work ability and its associations with age and intention to leave nursing in a representative sample of Registered Nurses in 10 European countries.

**Background.** Throughout Europe, there is now a substantial shortage of Registered Nurses and unless steps are taken to reverse this trend, numbers are likely to decline further. A study exploring nurses' perceived work ability will provide baseline evidence, which may lead to improved working conditions and increased nursing retention.

**Methods.** A cross-sectional study design was employed. Questionnaire data were collected from 25,976 nurses in 10 member states of the European Union between October 2002 and June 2003. The response rate was 52.9% for the total investigation and varied between countries from 32.4% to 76.9%. Perceived work ability was assessed using the Work Ability Index. Intention to leave was measured by asking nurses how often they thought about leaving nursing. Data were examined using analysis of covariance and adjusted logistic regression.

**Results.** In all 10 European countries, scores on the Work Ability Index were significantly lower ( $P < 0.01$ ) among older nurses ( $\geq 45$  years). Work ability varied among countries and differences between younger and older nurses were more pronounced in some countries. In all countries, there was a significant association between low Work Ability Index and intention to leave nursing (odds ratios between 1.98 and 21.46), especially among younger nurses. The association between work ability and intention to leave was most marked for those items on the Work Ability Index which explored subjective rather than objective aspects of work ability.

**Conclusion.** Attempts to redress nursing shortages could include institutional policies to sustain work ability through better working conditions, improving quality of the working environment and finding suitable alternative nursing work for those no longer able to cope in their current post. These approaches should include nurses in all age categories.

**Keywords:** age, European Union, nursing, retention, survey, work ability index, working conditions

## Introduction

Shortfalls in nursing numbers exist throughout Europe and the United States of America (USA) (Goodin 2003). Well-documented demographic changes in the structure of the population have profound consequences for healthcare provision in these countries. A reduction in the numbers of younger people of working age has occurred, while the numbers of older people no longer in paid employment is rising. Throughout Europe, there is a dearth of Registered Nurses and it is not clear how the increased need for nursing personnel will be met (Buchan & Calman 2004). One solution would be to increase the retirement age for nurses (see Hasselhorn *et al.* 2003a, Conway & Camerino 2005). However, few nurses continue to practise until they reach the existing age of retirement. For example, in Germany the retirement age for nurses is 65 but in 2002 only 1.3% of German active nurses was in the age group 60–65 years old (Statistisches Bundesamt 2003). The picture is similar in many other countries. For example, in the United Kingdom (UK) few nurses over 50 years of age continue to practise (Meadows 2002). Stelman (1976) has suggested that since nursing is physically and emotionally demanding, long-term employment as a nurse may lead to a reduction in 'work ability', which in turn may result in early retirement.

In the study described below, we examined whether nurses experience an age-related decline in perceived work ability,

the nature of any such perceptions, and whether perceived decline in work ability is associated with intention to leave. The study appears to be the most comprehensive of its kind.

## Background

Perceived work ability is a multifaceted concept, which depends on commitment, education and training, employment history and status, relationships with colleagues and support from managers (Ilmarinen 1999). The Work Ability Index (WAI) (Tuomi *et al.* 1998) is based on the assumptions that work ability is explained by an individual's perception of demands of the work environment and their ability to cope with them. Demands of the work environment include the physical and psychological requirements of work, support from colleagues and managers, and other factors associated with organizational climate. Perceived ability to cope with the demands relies on functional capacities (mental, physical and social resources) and the individual's health, competence, attitudes and values (Ilmarinen 2004a). Subjective experience of work ability is thought to result from congruency between perceived demands of the work environment and individual perceptions about personal resources (De Zwart *et al.* 2002).

Previous research has shown that scores on the WAI decline with age, and that decline is related to specific items of the scale (Pohjonen 2001). Tuomi *et al.* (1991b) found that

baseline WAI scores predicted mortality and move from paid employment to disability pension in a large sample of public sector employees, which included healthcare workers. In a second study, the WAI predicted early retirement for female cleaning staff 12 years later (Ilmarinen & Tuomi 2004b). The report below presents data from a major pan-European study, called Nurses' Early Exit Study (NEXT).

## The study

### Aim

The aim of this investigation was to explore: (1) relationships between age and perceived work ability; (2) the joint impact of work ability, age on intention to leave in a representative sample of Registered Nurses in 10 European countries.

In detail, we aimed to answer the following questions:

- Is there an association between perceived ability to work and age in nursing populations?
- If demonstrated, does this association hold good in the 10 countries examined?
- Is work ability associated with intention to leave?
- If so, which aspects of work ability are more associated with intention to leave nursing?

### Design

A cross-sectional survey was undertaken. The data were collected by questionnaire between October 2002 and June 2003.

### Participants

Ten European countries participated to this study: Belgium, Germany, Finland, France, England, Italy, Norway, the Netherlands, Poland and Slovakia. As the main purpose was to evaluate reasons for exit from nursing, in each country the number of participants to be sampled at baseline was calculated at 4000–8000 in order to obtain at least 500 leavers, according to power analysis calculations. A stratified sampling procedure was employed to reflect proportionally the national distribution of nurses according to type of institutions (hospitals, nursing homes, and home-care services), ownership (public or private) and territorial area (urban or rural) across country regions.

Questionnaires were sent to a total of 77,202 nursing staff from 585 healthcare institutions, covering all qualification levels (auxiliaries, Registered Nurses including specialist nurses). In Italy, auxiliaries were not included in the sample. A total of 39,689 respondents returned the questionnaire.

The response rate was 52.9% for the total investigation and varied between the participating countries from 32.4% to 76.9%. Out of the 39,689 respondents, the proportion of Registered Nurses was very high (between 89% in Belgium and 100% in Italy), with the only exception being France; this contributed only 57% Registered Nurses, thus reflecting a different distribution of nursing qualification in the French healthcare system. In order to allow for comparability across countries regarding work tasks, only Registered Nurses who had undergone at least three years preregistration preparation in accordance with European Union/World Health Organisation or comparable directives were eligible for inclusion in this study. This selection resulted in a final sample of 25,976 cases composed on Registered Nurses only. As demonstrated in another study conducted on the NEXT data, response rates for Registered and specialist nurses were fairly similar to those obtained for the entire sample (Simon *et al.* 2004).

### Data collection

Questionnaires were posted to the nurses' homes and returned in prepaid envelopes or distributed by a field manager in the employing institution and returned in sealed envelopes to the research team. In Belgium and England, the research team distributed and collected questionnaires.

### Measures

#### *Work ability index*

Perceived work ability was measured by the Work Ability Index (WAI). This has now been translated into 25 languages and is widely used in epidemiological studies (Ilmarinen & Tuomi 2004b). The WAI has the following seven domains (which in this paper will be called 'items', according to the authors' definition; see Tuomi *et al.* 1998): (1) subjective estimation of current work ability compared with optimal life time performance (0–10 points); (2) subjective work ability in relation to physical and mental demand of work (2–10 points; the score is weighted according to whether the work is primarily physical or mental); (3) number of diseases for which a medical diagnosis has been given (1–7 points; set beforehand scores according to the number of diseases diagnosed by a physician); (4) subjective estimation of working impairment because of ill health (1–6 point); (5) sickness absenteeism during the past year (1–5 points); (6) own prognosis of work ability after 2 years (1, 4 or 7 points; set beforehand scores anchored to the possible three answers); (7) psychological resources (enjoying daily tasks, activity and life spirit, optimistic about the future; 1–4 points). The total score is calculated by summing the item scores (Tuomi *et al.* 1998). The

range for the total score is 7–49 points, with higher scores indicating higher perceived work ability. Internal validity has been demonstrated (Eskelinen *et al.* 1991, Nygård *et al.* 1991) and the instrument is stable according to test–retest reliability analysis (De Zwart *et al.* 2002).

In the study described here, we adopted the short version of the WAI (Nübling *et al.* 2004). This version differs from the original WAI instrument in that item no. 3 contains only 15 medical conditions instead of 51, so that it is more readily completed and shows a better ‘face validity’. This was an advantage in a study which required respondents to complete a long questionnaire. Nübling *et al.* (2004) has developed an algorithm to allow for the comparability of the data obtained by the two versions and has found good convergent validity.

We treated the WAI as a continuous scale, when it was analysed as the dependent variable. When used as an independent variable, the total WAI score and single WAI items were categorized. We did not use the original categorization provided by the instruction manual. Instead, we categorized the WAI index in a manner that would maximize the lower and higher scores vs. the medium scores. Thus, the raw WAI scores were transformed into *z*-scores and three categories were identified as follows:  $z \leq 1.00$  coded as ‘low WAI’,  $z = -1.00$  to  $+1.00$  coded as ‘medium WAI’ and  $z \geq 1.00$  coded as ‘high WAI’. This procedure was applied to both the total WAI index and the single WAI items. Tripartition was not possible for items no. 4, 5 and 6, as no *z*-scores in their relevant distributions were equal or above  $z \geq +1.00$ . In these cases it was possible to create only two categories: low and medium scores. Table 1 shows the number of respondents in each category.

#### Intention to leave nursing

Intention to leave nursing was measured by a single question: ‘How often do you think about leaving nursing?’ Responses were rated on a five-point rating scale: ‘never’, ‘sometimes/year’, ‘sometimes/month’, ‘sometimes/week’, ‘every day’.

These categories were re-coded into two categories: high intention to leave (sometimes/month + sometimes/week - every day) and low intention to leave (never + sometimes/year). Intention to leave has been shown to predict exit from the workplace for nurses (Mobley *et al.* 1978, Parasuraman 1989). Thus, in our cross-sectional survey in which data concerning exit were not available, intention to leave was felt to be reasonable proxy indicator of exit.

#### Ethical considerations

Approval for the NEXT-Study was granted centrally by the University of Wuppertal in Germany and locally confirmed. Respondents were assured that all data would be treated in confidence and used for the purposes of the study only.

#### Data analysis

Due to the different countries’ sample compositions, most of the analyses were conducted separately for each country and controlled for socio-demographic variables. ANCOVA (covariates: gender, occupational position and type of institution) was performed for each country to assess the association between WAI score and age. A multilinear graph (see Figure 1) was created to explore associations between WAI score and age in each country. This analysis was restricted to respondents employed as staff nurses to avoid senior and managerial positions modifying the relationship between increasing ‘age’ and declining ‘work ability’. Multiple logistic regression analyses, adjusted for socio-demographic factors, were performed to test in each country the association between ‘intention to leave’ and the total WAI score and WAI items. Two-way ANCOVA was undertaken with the total sample to assess the interactive effect of ‘age’ and categories of the WAI items in accounting for intention to leave nursing. In these analyses, parametric data were used because the dependent variable ‘intention to leave’ was measured on

**Table 1** The seven Work Ability Index (WAI) items

Items no.	Item	% Low WAI	% Medium WAI	% High WAI
1	Subjective estimation of present work ability compared with the lifetime best	12.4	66.7	20.9
2	Subjective work ability in relation both to physical and to mental demands of the work	19.6	60.4	20.0
3	No. diagnosed diseases	15.8	44.6	39.6
4	Subjective estimation of work impairment because of disease	7.6	92.4	
5	Sickness absence during past year	12.3	87.7	
6	Own prognosis of work ability after 2 years	16.5	83.5	
7	Psychological resources (enjoying daily tasks activity and life spirit optimistic about the future)	23.9	51.1	25.0
Total WAI score		14.0	74.4	11.7

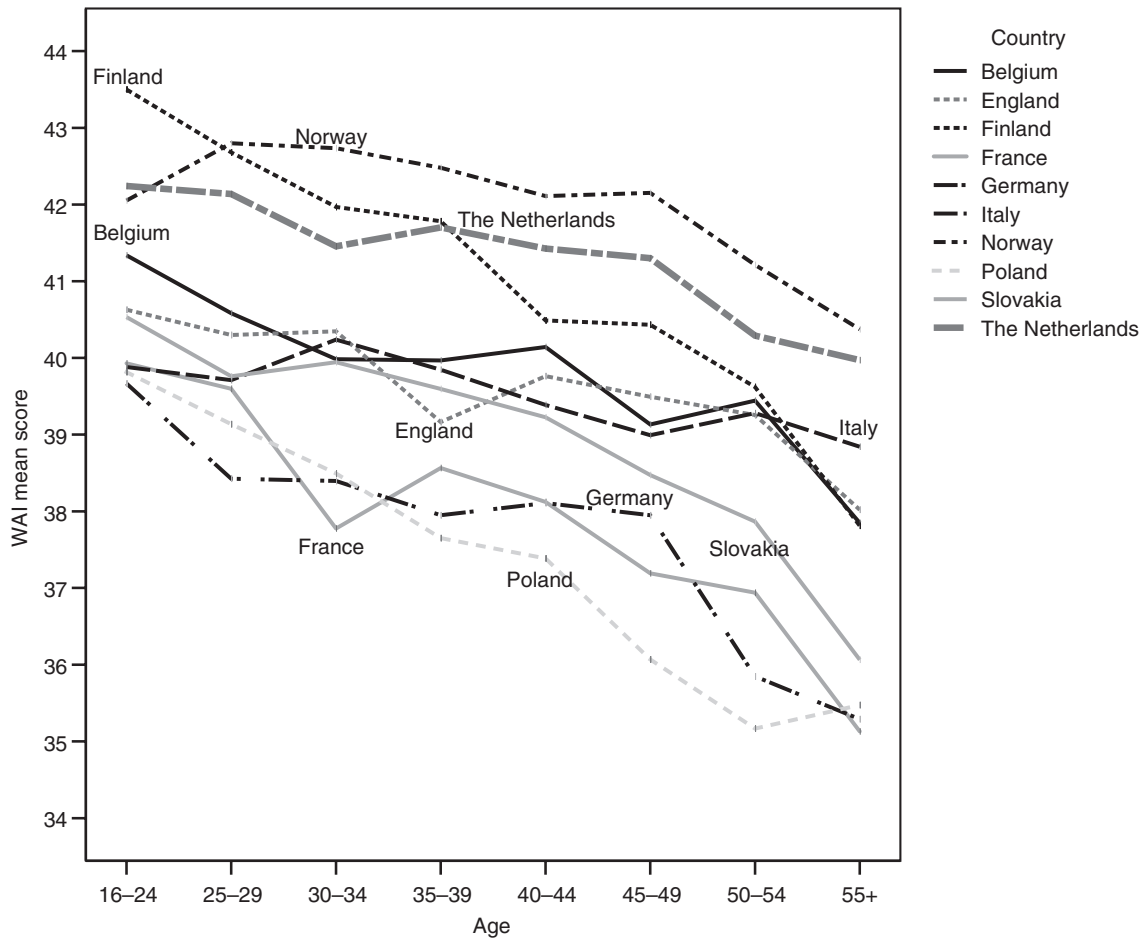


Figure 1 Association between staff nurses' age and work ability (Work Ability Index score) in 10 European countries.

a Likert-type scale and because of the large sample size. The statistical package SPSS 12.01 (SPSS Inc., Chicago, IL, USA) was used for data handling.

## Results

### Socio-demographic data

Analysis of the sample by country is shown in Table 2. All the differences in socio-demographic characteristics by country reached statistical significance at  $P = < 0.001$  on the chi-squared test. As expected, female nurses accounted for the majority in each country (72.6–99.1%). More men were included in the Italian sample (27.4%), and fewest in Poland and Slovakia. Most nurses were aged 30–44, except in Finland, where those over 45 years represented nearly half of the sample. In Belgium, Norway, the Netherlands and Germany, there were higher proportions of younger nurses (20–29 years). The sample overall was composed mainly by staff nurses. England

employed the highest number of nurse managers. In all countries, the majority of nurses worked in hospitals. In Slovakia, the Netherlands and Germany, there were slightly higher proportions of nurses working in nursing homes. Numbers employed in home care services were highest in Belgium.

### Association between age and work ability

A statistically significant relationship between age and low perceived work ability was observed in the overall sample and for individual countries (ANCOVA F-tests, adjusted for gender, occupational position and type of institution, ranged from  $F_{(7,1526)} = 2.87$ ,  $P = 0.006$  in Norway to  $F_{(7,2265)} = 27.36$ ,  $P < 0.001$  in Finland). When the data for staff nurses were analysed separately, a pattern emerged for the WAI scores obtained for younger and older nurses (Figure 1). The difference was less pronounced in Norway, the Netherlands, England and Italy than in the other countries; this result was still apparent when the graph was

Table 2 Sample socio-demographics by country

	N	Gender (%)		Age (%)			Occupational position (%)			Type of institution (%)		
		Female	Male	20–29	30–44	≥45	Nurse managers	Ward sisters	Staff nurses	Hospital	Nursing home	Home care
Overall	25,976	89.2	10.8	17.1	54.1	28.8	16.3	3.4	80.3	82	6.8	11.2
Belgium	3155	90.6	9.4	23.3	53.5	23.1	7.9	2.9	89.2	54.9	3.5	41.6
Germany	2595	81.9	18.1	20.6	53.5	25.8	11.0	9.8	79.1	82.6	10.1	7.3
Finland	2298	95.2	4.8	13.8	41.6	44.7	10.1	4.3	85.6	93.6	6.4	–
France	2116	88.0	12.0	19.4	49.4	31.2	(1.5)	(8.5)	(90) <sup>†</sup>	93.3	5.4	1.3
United Kingdom	1797	94.0	6.0	15.9	50.5	33.6	22.6	10.7	66.8	89.6	3.5	6.9
Italy	3778	72.6	27.4	10.0	66.7	23.3	8.2	1.0	90.8	85.0	3.4	11.5
Norway	1542	90.8	9.2	23.3	45.5	31.2	13.3	–	86.7	100.0	–	–
The Netherlands	3213	89.7	10.3	21.5	49.1	29.4	Not available*			70.3	17.1	12.6
Poland	3540	99.1	0.9	11.7	62.5	25.9	7.2	2.7	90.1	87.3	4.3	8.4
Slovakia	1942	98.3	1.7	17.2	53.7	29.1	4.5	3.3	92.2	86.0	11.6	2.4

\*Percentages related to occupational position are not available for The Netherlands owing to unreliable values.

<sup>†</sup>Ward sisters and nurse directors in France were not used in the analyses as in our dataset they were not coded in the category labelled 'qualified or specialist nurses'.

repeated by gender and by different types of institutions. Figure 1 shows that the mean scores of work ability for younger nurses (20–29 years) fall into three groups: lower work ability group, comprised of Poland, Germany, France and Italy; intermediate work ability group in Belgium and England; and higher work ability group comprising Norway, the Netherlands and Finland. Slovakia straddled the lower and intermediate work ability groups. In countries where work ability scores were lower at an earlier age, differences in work ability scores between younger and older nurses were more pronounced. There were, however, two exceptions. In Belgium, results were more unfavourable for older nurses even when work ability scores of younger nurses were intermediate. In Finland, 'work ability' for

older nurses was quite low, although WAI scores among younger nurses were the highest in the 10 countries examined.

#### Association between work ability and intention to leave nursing

Irrespective of country, 'intention to leave' was higher among nurses with low perceived 'work ability' (see Table 3). 'Intention to leave' could also be seen to a lesser extent among nurses reporting medium or high 'work ability'. The proportion of nurses with low 'work ability' and high 'intention to leave' was highest in England and lowest in the Netherlands, Poland and Slovakia. Overall, younger nurses with low 'work

Table 3 Association between high intent to leave the nursing profession and Work Ability Index (WAI) levels by country (in %)

Countries	N	Low WAI* high intent to leave	Medium WAI* high intent to leave	High WAI* high intent to leave	Chi-squared <sup>†</sup> (P value)
Overall	25,976	31.2	13.9	8.1	839.63*
Belgium	3155	30.5	8.3	1.9	176.19*
Germany	2595	36.2	15.0	6.6	145.29*
Finland	2298	32.5	14.5	9.2	64.53*
France	2116	37.8	12.8	6.7	149.49*
United Kingdom	1797	69.4	34.5	16.3	152.24*
Italy	3778	35.3	19.2	10.6	91.04*
Norway	1542	33.0	13.4	9.3	37.98*
The Netherlands	3213	22.7	8.8	5.4	56.15*
Poland	3540	18.5	8.6	8.1	67.64*
Slovakia	1942	16.3	11.6	8.3	6.71**

<sup>†</sup>d.f. = 2 for all countries. P value: \* < 0.001; \*\* < 0.05. 'High intention to leave' includes cases who declared thinking about leaving nursing 'sometimes/month', 'sometimes/week' and 'everyday'.

ability' reported higher 'intention to leave nursing' compared with their older counterparts (two-way ANCOVA F-test for the interaction term 'age' [3 levels] × 'WAI' [3 levels], adjusted for gender, occupational position and type of institution:  $F_{(4,25572)} = 3.53; P = 0.007$ ).

When items on the WAI score were considered independently, the greatest intention to leave nursing was associated with low perceived ability to work compared with lifetime best (item no. 1) among younger nurses (two-way ANCOVA F-test for the interaction term 'age' [3 levels] × 'WAI item no. 1' [3 levels], adjusted for gender, occupational position and type of institution:  $F_{(4,25572)} = 2.92, P = 0.02$ ). Similarly, 'intention to leave' was higher for younger than for older nurses, if they believed that they would not have effective work ability in the next two years WAI item no. 6; two-way ANCOVA F-tests for the interaction term 'age' [3 levels] × 'WAI item no. 6' [2 levels], adjusted for gender, occupational position and type of institution:  $F_{(2,25575)} = 14.69, P < 0.001$ . Older nurses reporting increased numbers of days of sickness (WAI item no. 5) were more likely to report higher 'intention to leave nursing' than their younger colleagues (Two-way ANCOVA F-test for Interaction term 'age'-3 levels × WAI items nos. 5-2 levels-adjusted for gender, occupational position and type of institution:  $F_{(2,25575)} = 6.97; P = 0.001$ ).

Table 4 shows odds ratios and 95% confidence intervals obtained by logistic regression analyses adjusted for gender, age, occupational position and type of institution, for high 'intention to leave' in the medium and low- vs. high-WAI categories. In all countries, these associations were statistically significant, although the effect sizes differed. These associations were highest in Belgium and lowest in Slovakia and Poland.

Table 5 shows odds ratios and 95% confidence intervals, adjusted for gender, age, occupational position and type of institution, resulting from logistic regression analyses testing the associations between individual WAI items and 'intention to leave nursing'. Most odds ratios were statistically significant and pointed to an increasingly high 'intention to leave' for nurses in the medium and low categories of each WAI item explored, with the exception of the odds ratios relative to nurses with low 'perceived work ability' measured by WAI item no. 3 in Norway and WAI item no. 5 in Poland and Slovakia, which did not reach statistical significance. Subjective estimations of work ability and resources, as evaluated by WAI items 1, 2, 6 and 7, were more closely associated with increased 'intention to leave'. In most countries, WAI items 3, 4 and 5 exhibited the lowest statistically significant odds ratios. Poland and Slovakia, followed by Norway and Italy, generated the lowest odds ratios for high intention to leave in relation to decreased work ability on the majority of WAI items.

## Discussion

### Study limitations

Response rate was low in some countries and a random sample was not obtained, reducing the generalizability of findings (Hasselhorn *et al.* 2004, Simon *et al.* 2004). The cross-sectional design means that conclusions about causal relationships between ageing and work ability and between work ability and intention to leave nursing should be drawn with caution. In particular, in cross-sectional research, differences in work ability observed between age groups may be confounded by

**Table 4** Association between total Work Ability Index (WAI) score and intent to leave nursing by country

Country			Step 1*				Step 2†			
	N high ITL	N low ITL	OR medium WAI	95% CI	OR low WAI	95% CI	OR medium WAI	95% CI	OR low WAI	95% CI
Belgium	304	2817	4.49	1.98-10.20	21.46	9.22-49.96	3.90	1.71-8.91	18.85	8.03-44.26
Germany	485	2080	2.52	1.42-4.49	7.84	4.35-14.14	2.46	1.38-4.40	8.89	4.90-16.16
Finland	290	1530	1.59	1.04-2.43	4.20	2.54-6.95	1.75	1.14-2.70	5.99	3.54-10.14
France	365	1740	2.04	0.94-4.46	8.41	3.81-18.59	2.07	0.94-4.54	8.31	3.75-18.47
England	655	1125	2.69	1.86-3.88	11.16	7.15-17.42	2.71	1.88-3.92	11.60	7.41-18.17
Italy	752	2953	2.01	1.44-2.81	4.55	3.14-6.61	2.06	1.47-2.88	4.98	3.41-7.26
Norway	182	1119	1.42	0.96-2.10	3.88	2.12-7.13	1.47	0.99-2.19	4.50	2.42-8.38
The Netherlands	292	2913	1.70	1.15-2.50	5.18	3.18-8.42	1.80	1.22-2.65	6.22	3.79-10.23
Poland	321	2696	1.37	0.76-2.44	3.50	1.94-6.31	1.58	0.88-2.84	4.47	2.45-8.15
Slovakia	223	1653	1.38	0.76-2.49	1.98	1.02-3.86	1.40	0.78-2.55	2.30	1.17-4.52

\*Crude odds ratios (OR) and 95% confidence intervals (CI).

†Odds ratios and 95% confidence intervals adjusted for age, gender, occupational position and type of institution.

WAI, Work Ability Index; ITL, intent to leave nursing.

**Table 5** Associations between Work Ability Index (WAI) items and intent to leave the nursing profession by country (odds ratios and 95% confidence intervals for high intent to leave adjusted for age, gender, occupational status and type of institution obtained by multiple logistic regressions)

Country	WAI-1		WAI-2		WAI-3		WAI-4		WAI-5		WAI-6		WAI-7									
	OR (medium)	95% CI	OR (medium)	95% CI	OR (medium)	95% CI	OR (low)	95% CI	OR (low)	95% CI	OR (low)	95% CI	OR (medium)	95% CI								
Belgium	2.68	1.61-4.44	10.61	6.06-18.56	1.81	1.14-2.86	4.44	2.73-7.22	1.72	1.28-2.30	3.65	2.61-5.11	2.15	1.63-2.83	1.75	1.08-2.82	4.24	3.22-5.59	2.69	1.63-4.42	9.75	5.83-16.33
Germany	1.34	0.91-1.96	3.43	2.29-5.15	1.97	1.31-2.96	5.46	3.62-8.24	1.43	1.12-1.83	2.44	1.85-3.22	2.62	1.85-3.73	1.46	1.04-2.07	4.42	3.47-5.63	2.65	1.77-3.96	9.48	6.35-14.16
Finland	1.39	0.95-2.02	4.40	2.62-7.40	1.55	1.12-2.13	3.07	2.06-4.56	1.31	1.00-1.72	2.03	1.34-3.09	4.00	2.41-6.34	1.96	1.34-2.86	4.16	2.90-5.96	1.57	1.10-2.22	4.34	3.00-6.28
France	1.81	1.05-3.14	5.17	2.90-9.24	1.40	0.83-2.38	4.09	2.40-6.96	0.95	0.72-1.24	1.96	1.41-2.71	2.52	1.80-3.54	1.29	1.00-1.67	3.97	3.02-5.23	2.77	1.90-4.05	7.09	4.78-10.53
England	1.61	1.24-2.08	5.50	3.77-8.01	1.90	1.43-2.53	4.38	3.21-5.96	1.32	1.07-1.63	2.17	1.60-2.95	2.54	1.76-3.66	2.07	1.48-2.93	3.66	2.80-4.78	2.12	1.62-2.78	5.21	3.91-6.94
Italy	1.24	1.01-1.53	2.66	2.00-3.55	1.29	1.05-1.60	2.60	2.00-3.38	1.24	1.03-1.50	2.06	1.65-2.58	2.03	1.52-2.70	1.40	1.12-1.75	1.12	1.76-2.58	1.97	1.58-2.46	5.07	3.98-6.47
Norway	1.17	0.83-1.67	2.33	1.33-4.08	1.18	0.83-1.66	3.89	2.35-6.44	1.02	0.73-1.43	1.30	0.68-2.47	1.89	1.10-3.25	2.79	1.54-5.05	3.70	2.34-5.87	1.12	0.77-1.64	3.04	2.00-4.63
The Netherlands	1.60	1.21-2.12	4.99	3.42-7.27	1.43	0.00-2.07	5.62	3.41-9.28	1.42	1.09-1.85	2.49	1.65-3.74	2.45	1.65-3.65	1.88	1.36-2.59	4.74	3.15-7.17	1.57	1.16-2.13	5.59	3.57-8.74
Poland	1.61	1.06-2.42	3.62	2.34-5.59	1.16	0.79-1.70	2.31	1.55-3.44	1.11	0.84-1.47	1.62	1.19-2.20	2.12	1.44-3.12	0.99	0.73-1.36	2.26	1.78-2.88	1.13	0.69-1.84	3.31	2.09-5.23
Slovakia	1.29	0.88-1.90	2.53	1.50-4.25	0.88	0.61-1.27	1.53	1.04-2.27	1.22	0.89-1.68	1.65	1.11-2.45	2.91	1.50-5.63	1.17	0.82-1.69	1.72	1.24-2.38	1.33	0.81-2.19	1.98	1.22-3.21

biases such as the birth cohort effect (Costa 2000). The data were self-reported and this may introduce recall bias or common method variance on the observed associations between work ability and intention to leave nursing. Lastly, the statistically significant interactive effect found between WAI item no. 1 and age on intent to leave nursing must be regarded with caution. Since for each of the seven WAI items interaction with age was tested on the same respondents, the different hypotheses cannot be considered as independent. In the case of WAI item no. 1, while statistical significance of interaction was at the  $P = 0.02$  level, application of the Bonferroni correction factor for multiple hypothesis testing resulted in real statistical significance at the  $P = 0.14$  level.

### Age and work ability

Our findings corroborate earlier work, which demonstrated an association between 'age' and low 'perceived work ability' among healthcare workers (Tuomi *et al.* 1991a, Ilmarinen *et al.* 1997, Costa *et al.* 2002). The differences in 'perceived work ability' between the countries for staff nurses in the different age groups could reflect differences in nursing work and employment conditions (Tuomi *et al.* 1991a, 1997, McVicar 2003, Camerino *et al.* 2005). Attitudes towards older nurses, professional and career opportunities, occupational health policies and the age at which pension can be drawn vary throughout the 10 countries, and these variables may help to explain the differences between younger and older nurses in relation to workload and resources available to cope with work demands and their effects on work ability (Camerino *et al.* 2005). In five countries (Finland, Germany, France, Poland, Slovakia) age-related differences in 'perceived work ability' between younger and older staff nurses were higher than elsewhere.

In Finland, the difference in work ability between the younger and older age groups was the most marked: between 1995 and 2003 the overall employment rate for those aged 50-64 rose from 34% to 61%. Many older Finnish nurses have been obliged to continue working despite low work ability because early retirement has become more difficult, with a lack of suitable alternative employment. Although occupational health services are well established in Finland, they are aimed more at the individual level rather than being implemented as part of institutional policy.

In Germany, where the retirement age is 65, it is possible that differences in perceived work ability associated with age are related to increasingly demanding work conditions in the healthcare sector associated with the country's declining economic situation (Hasselhorn *et al.* 2003b).



In France, retirement is not possible before 56 years (since 2003), and only recently, in an effort to maintain the workforce, has legislation been passed to prevent discrimination against older people who wish to carry on working. The low WAI levels observed in older French staff nurses may be associated with the need to continue working despite its physical and emotional demands (Estryn-Béhar *et al.* 2001). In Slovakia and Poland, working conditions are harsh compared with the other countries included in the sample, and occupational health services are poor, which probably accounts for the particularly low perceived work ability of nurses in these countries. There is little choice of employment and large numbers of people are unable to find work; thus, nurses of all ages remain at their current workplace despite poor perceived work ability (Pokorski *et al.* 2004a, 2004b). Furthermore, owing to the low statutory retirement age in these two countries (55 and 60 for women respectively in Slovakia and Poland), it is likely that older nurses decided to stay at work even when levels of work ability are low as they have few working years ahead of them before pension.

In the other countries, age differences in work ability are less pronounced. In Norway and the Netherlands, higher work ability in all age groups can be partly explained by better working conditions or the lower mean number of hours/week worked (24.8 in the Netherlands and 26.9 in Norway in the NEXT sample; Tackenberg *et al.* 2003). According to OECD labour market indicators, large proportions of the working population, especially women, are employed part-time in these two countries (OECD 2004). In the Netherlands, nursing has received considerable attention from the media and researchers, and this has probably contributed to an improvement of Dutch nurses' working conditions (Hasselhorn *et al.* 2004). Similarly, the relatively lower differences in work ability between younger and older age groups found in Belgium may be a product of recent government initiatives to reduce working hours progressively for nurses approaching retirement. In Belgium, the choice of work available for female nurses is greater than in many of the other countries we examined, for example in government-funded posts, nursing, social services and the public sector.

In England, few nurses over 50 work in the National Healthcare System (NHS) and at present their age of eligibility for the NHS pension is 55 for women and 60 for men (Watson *et al.* 2003). Thus, older nurses who are still employed may be fitter than their retired colleagues (healthy worker effect), or they may work part-time as agency or bank nurses. These schemes are attractive because they enable nurses to select which hours they work. This may help to account for the less pronounced age-related differences in

work ability found in the data from England. The same 'healthy worker effect' may be operating in Italy, where legislation has enabled employees to take early retirement. This may help to account for the lower age-related differences in work ability found in Italy.

### Work ability and intention to leave nursing

Low work ability was associated with higher intention to leave nursing in all 10 countries. These findings confirmed those of a study which directly assessed the relationship between work ability and intention to leave for food industry employees (Salonen *et al.* 2003), and other studies which found premature departure from working life to be associated with poor work ability (Ilmarinen *et al.* 1997, Tuomi *et al.* 1997). The association between low work ability and high intention to leave nursing was stronger among younger nurses, as they probably have more opportunities than their older colleagues to find more congenial employment. Lower intention to leave among older nurses may be related to increased resistance to change and the phenomenon known as 'ecological niche' (Kaufman 1971). This describes the situation in which individuals find a comfortable niche within the work environment, which suits their present abilities and aspirations after years of toil. Nevertheless, not all nurses reporting low work ability displayed evidence of wanting to leave, probably because of the difficulty in finding alternative employment or fitting into a new workplace. Similarly, not all nurses who declared a high intention to leave showed low perceived work ability. In this respect, fitter nurses would have greater potential for employment mobility because they would be more attractive to prospective employers and would have more energy to seek alternatives.

Specific WAI items were clearly associated with intention to leave nursing. Those more strongly related to intention to leave were similar in all countries, but the strength of association differed. Items of the WAI scale evaluating individual's perceived work ability were the most strongly associated with increased intent to leave, and this appeared to be the most important determinant. However, objective aspects of work ability (i.e. 'number of diagnosed medical conditions' and 'days of sickness absence per year') were also statistically significantly associated with higher intent to leave nursing.

### Conclusion

This study demonstrates that low perceived ability to work increases with age for nurses and is a factor that policy-makers and managers should consider as part of their overall strategies to increase nursing retention. Measures could be taken to meet

### What is already known about this topic

- The relationship between age and decreased work ability in nursing is well established.
- Low work ability predicts early retirement.
- Adverse working conditions affect the health and work ability of nurses.

### What this paper adds

- European Registered Nurses show different socio-demographic characteristics and occupational arrangements across countries, in accordance with recruitment and retirement policies and support systems aimed at ageing workers.
- Nurses working in countries adopting solutions such as more flexible work schedules and community work show higher perceived work ability.
- As low perceived work ability was found to be a problem across all ages, adequate policies should be implemented to support nurses in the younger age groups.

specific needs of older nurses, such as more flexible work schedules, 'family-friendly' policies and availability of opportunities for continuing professional education (Watson *et al.* 2003). New, creative ways of encouraging nurses to remain in nursing will become increasingly important throughout Europe as a consequence of health service re-organization, competitiveness for staff between institutions, a different distribution of healthcare staff (with an increase number of community nurses), reformed nursing education systems, the introduction of new technologies, staff migration, and an increasingly older patient population suffering from chronic, long-term health problems. These new aspects are a cause for concern because, like any change, they may interfere with the possibility of planning and control one's own future. From this perspective, they may constitute pull factors which, in addition to those described earlier, can bring about a further decrease in the attractiveness of nursing among younger people and an increase in the likelihood of deciding to leave the nursing profession among currently employed nurses.

As age still remains associated with a reduction in work ability in nursing, it seems reasonable to carry out further research on the role of unfavourable working conditions in boosting premature depletion of work capacity. The NEXT-Study identifies important variables with which to evaluate this process in a longitudinal perspective, for example aspects related to work characteristics and organization such as job demands and the quality of the work community.

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### Author contributions

Dco was responsible for the study conception and design and drafting of the manuscript. Dco, PMC, BIJMVH, MEB, DG and HMH performed the data collection and data analysis. HMH obtained funding and provided administrative support. PMC and Dca provided statistical expertise. HMH, Dco, vHBIJM and MEB made critical revisions to the paper. DG supervised the study.

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