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Original Article

Factors associated with work ability and intention to leave nursing profession: a nested case-control study

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Abstract: This study aims to identify factors associated with impaired work ability and intention to leave the nursing profession. This is a case-control nested within a cross-sectional study. Samples were randomly selected for work ability (475 controls and 158 cases) and intention to leave profession (454 controls and 151 cases). Data on demographic, lifestyle, occupational features, work environment, work ability and intention to leave profession were collected. Multiple logistic regression analysis was performed. Factors associated with work ability impairment were: risk for moderate (OR=1.28) and high (OR=2.26) job strain, effort-reward imbalance (OR=2.82), high overcommitment (OR=1.77), situations that may contribute to musculoskeletal pain/injury with moderate (OR=1.82) or high (OR=2.58) exposures, degree level (OR=2.13) or elementary/high school level (OR=1.67), and low physical activity (OR=1.74). Age of 31–40 years (OR=0.26) and ≥41 years (OR=0.27) were protective factors. Factors associated with intention to leave profession were: high risk for job strain (OR=1.81), effort-reward imbalance (OR=3.25), situations that may contribute to musculoskeletal pain/injury with high exposure (OR=1.54), and insomnia symptoms (OR=2.72). Age >40 years was a protective factor (OR=0.50). Individual characteristics and occupational conditions were associated with work ability impairment and intention to leave profession. Measures to improve working conditions and individual resources were recommended.

Key words: Work ability, Nursing workforce, Work environment, Risk prevention, Occupational health, Work capacity evaluation

Introduction

Work ability is defined as a worker's physical and mental conditions to cope with the physical and mental demands of work[1–3]. Work ability is a measure of the balance between individual resources (health status, functionalities, profes-

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sional competencies, values, attitudes and motivation) and work-related characteristics (demands, content, environment, organization and management), influenced by external social and family factors[1–3]. The predictive value of Work ability for sick leave, use of health services and employability is recognized, and influences premature departure from the profession[4–6].

Early exit from the profession, before statutory retirement age, may be the result of pressure or attraction factors. Pressure factors are adverse aspects that make people wish to give up work, such as negative working conditions or health problems. Attraction factors are incentives, such as the chance to study, pursue a new career or pension rules[4]. Intention to leave is predictor of a definitive decision to exit the profession within 12 months of exhibiting intention to leave[4].

Nurses accounts for around 50% of the workforce in the health sector. Nursing professionals are involved in a range of roles and care and management settings, working to meet demographic, universal health coverage and healthcare challenges[7–10]. Impaired work ability and early exit from the profession negatively impacts the jobs market, as well as health and pension systems in terms of maintaining a sufficient, high quality workforce[4, 6]. The nursing profession continues to face problems involving poor working conditions, ineffective public policy, understaffing, low recognition, and restricted autonomy, aspects which can affect both work ability and intention to leave[4, 6–8]. The present case-control study sought to identify factors associated with work ability impairment and intention to leave among nursing professionals.

Method

Study design and participants

A cross-sectional study was conducted among nursing professionals of São Paulo state (25% of contingent in Brazil), registered in 14 regional subsections of the Regional Nursing Council. Of the 411,162 professionals eligible, 1.0% (3,993 volunteers) enrolled on the study. Of this population, 942 (23.6%) were currently not practicing in the profession, while 3,051 (76.4%) were in active service, giving an overall enrolment rate of 0.74%.

In order to investigate factors associated with impaired work ability and with intention to leave nursing we decided to conduct two nested case-control analysis. The first one was to investigate factors associated with impaired work ability.

The sample size was calculated assuming a 30% event rate for work ability (11), α=5% alpha and (1-β)=90.0%. The cases were considered the people who had impaired (moderate and low) work ability (158 cases). We randomly sampled 3 controls per case, and a 20.0% replacement rate (475 controls), among those who had preserved (excellent or good) work ability.

The second study was to investigate factors associated with intention to leave nursing. The sample size was calculated assuming a 35% for intention to leave (11), α=5% and (1-β)=90.0%, inclusion of 3 control subjects per case, and a 20.0% replacement rate. The cases were considered the people who had intention to leave (151 cases). We randomly sampled 3 controls per case, and a 20.0% replacement rate (454 controls), among those who had no intention to leave.

Data collection and studied variables

Data collection was carried out between October 2018 and March 2019 with the support of Regional Nursing Council of São Paulo, which sent out emails to the professionals containing a link for internet access to access the data collection form. The form contained questions on sociodemographic characteristics (sex, age, marital status, place of residence, monthly family income, Regional Nursing Council subsection), lifestyle (tobacco use, CAGE questionnaire for assessing alcohol use risk[11], physical activity level, body mass index, the Karolinska Sleep Questionnaire – KSQ for assessing sleep quality[12], occupational history (age at joining the workforce, time working in nursing, nursing education, employment contract type, area of expertise, position/function, work shift, working week, recent history of work-related disease or injury). Urban development index was estimated using municipal data.

The psychosocial work environment was assessed using the Job Stress Scale (JSS) adapted from the Job Content Questionnaire (JCQ) for use in Brazil, based on the Demand-Control Model, measuring demands, control and social support at work[13, 14]. Dimension scores were categorized into high or low according to mean point of the score[6]. Demand and control dimensions were combined into 4 categories of risk for job strain (high job strain, active job, low job strain and passive job)[13]. Demand/control ratio was estimated, yielding a score ranging from 0.21 to 3.33 points, subsequently categorized by tertiles, where higher scores indicate greater risk of job strain[2, 15, 16].

Psychosocial environment was also assessed using the Brazilian version of the Effort-Reward Imbalance (ERI) questionnaire, structured based on the theoretic model bearing the same name and comprising the dimensions ef-

fort, reward and overcommitment[17, 18]. The effort-reward ratio was calculated and multiplied by 6/11, giving a coefficient ranging from 0.17 to 5.00 points, where scores above 1.0 indicate imbalance[17, 18]. Scores were then also categorized into tertiles, with higher score indicating greater risk of job strain[2].

Working conditions that may contribute to musculoskeletal disorders were assessed using the version of the Work-Related Activities That May Contribute To Job-Related Pain and/or Injury (WRAPI) scale validated for use in Brazil[19]. This is a 15-item instrument yielding a score of 0–150 points, with higher scores indicating worse situation[19]. Scores on the scale were categorized into tertiles[2].

The work ability outcome was measured using the Brazilian version of the Work Ability Index – WAI[20], comprising 7 dimensions and yielding a score of 7–49 points. Scores were calculated according to Tuomi *et al.* (2005)[3] and Kujala *et al.* (2005)[21], considering differentiation of workers from 35 years of age and older. The variable was dichotomized into cases (impaired work ability – moderate and low) and control subjects (preserved work ability – excellent or good).

The intention to leave outcome was assessed based on the question from the NEXT-Study (Nurses' Early Exit Study), "How often during the course of the past year have you thought about giving up nursing?", with 6 response categories. The variable was dichotomized into cases (presence of intention to leave nursing profession, with answer categories "sometimes a month", "sometimes a week", "every day") and control subjects (with answer categories "never" or "sometimes a year")[4].

Assessment using Cronbach's Alpha coefficient revealed that all scales provided satisfactory reliability (>0.65).

Statistical analysis

To verify the association between work ability and intention to leave, the chi square test was used. We analysed the 2 outcomes (impaired work ability or intention to leave) separately, using the chi-square test and univariate/multiple logistic regression models. Model fit was determined using the Hosmer-Lemeshow test. The risk measure was odds ratio (OR) and a 95% confidence interval.

Ethical aspects

The study was approved by the Regional Nursing Council of São Paulo and by the Research Ethics Committee of the School of Public Health, University of São Paulo (ruling nº 2.614.513). The researchers were not given access to the databases containing registration information on the professionals in order to ensure information security rules (invulnerability and confidentiality) of Regional Nursing Council of São Paulo. All participants signed the Free and Informed Consent Form and confidentiality of individuals' data was guaranteed. The study observed the principles of the Declaration of Helsinki and of the Council for International Organizations of Medical Sciences.

Results

There was a strong association was found between impaired work ability and intention to leave ($p<0.001$) (data not shown). Among those with intention to leave 10.4% were individuals with excellent work ability, 22.0% were individuals with good work ability, 39.4% had moderate work ability and 46.9% had low work ability. Because of this, impaired work ability is not included in the model for intention to leave.

Univariate analysis revealed a statistically significant association between work ability and the younger age group ($p<0.001$), lower monthly family income ($p=0.021$), sedentarism ($p=0.002$), intermediate or poor sleep quality ($p<0.001$) and insomnia ($p<0.001$). The factors showing significant associations with intention to leave were: male gender ($p=0.001$), age groups ≤40 years ($p<0.001$), married/partner or single marital status ($p=0.042$), intermediate or poor sleep quality ($p<0.001$) and insomnia ($p<0.001$) (Table 1).

The occupational categories/variables associated with impaired work ability were: qualification as nursing technician or assistant ($p=0.037$), qualified but without post-graduate degree ($p=0.001$), time in the profession of 6–10 years ($p<0.001$), function involving provision of care to patients ($p=0.017$), and history of work-related disease or injury ($p<0.001$). Associations with intention to leave were: time in profession of 6–15 years ($p=0.014$), involvement in hospital areas or emergency service ($p=0.014$), holding second job ($p=0.017$), and history of work-related disease or injury ($p=0.008$) (Table 2).

All job characteristics had a statistically significant association, with increased risk of work ability impairment in cases of worst exposures to job stressors (all $p<0.004$). The same pattern was found for intention to leave (all $p<0.001$), except for the variables job demand, control, psychosocial risk situation and job strain (Table 3).

Multiple logistic regression analysis showed that the independent variables associated with work ability impairment were: demand/control ratio indicating high exposure to psychosocial risk for strain (OR=2.26; 95% CI=1.32–

Table 1. Distribution of controls and cases according to demographic and lifestyle characteristics, Nursing workers, São Paulo State, 2019

Variable	Impaired work ability							Intention to leave nursing profession						
	Controls		Cases		Total		*p**	Controls		Cases		Total		*p**
	nº	%	nº	%	nº	%		nº	%	nº	%	nº	%	
Sex														
Female	392	74.2	136	25.8	528	100.0	0.299	399	77.5	116	22.5	515	100.0	0.001
Male	83	79.0	22	21.0	105	100.0		55	61.1	35	38.9	90	100.0	
Age (years)														
≤30	42	50.6	41	49.4	83	100.0	<0.001	72	69.9	31	30.1	103	100.0	<0.001
31–40	185	78.1	52	21.9	237	100.0		153	68.6	70	31.4	223	100.0	
≥41	248	79.2	65	20.8	313	100.0		229	82.1	50	17.9	279	100.0	
Marital status														
Married / living with a partner	308	76.2	96	23.8	404	100.0	0.635	292	73.7	104	26.3	396	100.0	0.042
Divorced / widowed	54	72.0	21	28.0	75	100.0		69	86.3	11	13.8	80	100.0	
Single	113	73.4	41	26.6	154	100.0		93	72.1	36	27.9	129	100.0	
Monthly family income (US dollars)														
≥1,804	149	81.9	33	18.1	182	100.0	0.021	111	71.6	44	28.4	155	100.0	0.242
>773.5 and <1,804	217	74.1	76	25.9	293	100.0		231	78.0	65	22.0	296	100.0	
≤773.5	109	69.0	49	31.0	158	100.0		112	72.7	42	27.3	154	100.0	
Place of residence														
Capital of the state	194	75.8	62	24.2	256	100.0	0.722	199	76.2	62	23.8	261	100.0	0.551
Countryside	281	74.5	96	25.5	377	100.0		255	74.1	89	25.9	344	100.0	
Human development Index														
Very high	303	77.9	86	22.1	389	100.0	0.096	290	75.7	93	24.3	383	100.0	0.870
High	169	70.7	70	29.3	239	100.0		159	74.0	56	26.0	215	100.0	
Medium	3	60.0	2	40.0	5	100.0		5	71.4	2	28.6	7	100.0	
Smoking														
Never smoked	340	73.1	125	26.9	465	100.0	0.190	347	75.9	110	24.1	457	100.0	0.180
Former smoker	92	80.0	23	20.0	115	100.0		77	76.2	24	23.8	101	100.0	
Current smoker	43	81.1	10	18.9	53	100.0		30	63.8	17	36.2	47	100.0	
Alcohol use risk														
No	461	75.2	152	24.8	613	100.0	0.597	439	75.6	142	24.4	581	100.0	0.147
Yes	14	70.0	6	30.0	20	100.0		15	62.5	9	37.5	24	100.0	
Regular practice of physical activity														
Yes	241	80.6	58	19.4	299	100.0	0.002	194	78.2	54	21.8	248	100.0	0.131
No	234	70.1	100	29.9	334	100.0		260	72.8	97	27.2	357	100.0	
Body mass index														
Normal	183	76.6	56	23.4	239	100.0	0.908	167	78.0	47	22.0	214	100.0	0.296
Overweight	164	74.5	56	25.5	220	100.0		166	75.8	53	24.2	219	100.0	
Obesity	123	73.7	44	26.3	167	100.0		113	71.1	46	28.9	159	100.0	
Not informed	5	71.4	2	28.6	7	100.0		8	61.5	5	38.5	13	100.0	
Sleep quality														
Good	348	80.0	87	20.0	435	100.0	<0.001	272	85.5	46	14.5	318	100.0	<0.001
Intermediate	92	67.2	45	32.8	137	100.0		130	67.0	64	33.0	194	100.0	
Poor	35	57.4	26	42.6	61	100.0		52	55.9	41	44.1	93	100.0	
Insomnia														
No	274	87.5	39	12.5	313	100.0	<0.001	196	88.3	26	11.7	222	100.0	<0.001
Yes	201	62.8	119	37.2	320	100.0		258	67.4	125	32.6	383	100.0	
Total	475	75.0	158	25.0	633	100.0		454	75.0	151	25.0	605	100.0	

* Chi square test

Table 2. Distribution of controls and cases according to occupational features, Nursing workers, São Paulo State, 2019

Variable	Impaired work ability							Intention to leave nursing profession						
	Controls		Cases		Total		p*	Controls		Cases		Total		p*
	nº	%	nº	%	nº	%		nº	%	nº	%	nº	%	
Professional category														
Registered nurse	321	78.3	89	21.7	410	100.0	0.037	276	73.6	99	26.4	375	100.0	0.235
Nurse technician	128	68.8	58	31.2	186	100.0		151	75.9	48	24.1	199	100.0	
Nurse assistant	26	70.3	11	29.7	37	100.0		27	87.1	4	12.9	31	100.0	
Nursing education														
College education with postgraduate degree	267	81.4	61	18.6	328	100.0	0.001	216	74.7	73	25.3	289	100.0	0.374
College education	54	65.9	28	34.1	82	100.0		60	69.8	26	30.2	86	100.0	
High and elementary school	154	69.1	69	30.9	223	100.0		178	77.4	52	22.6	230	100.0	
Age at joining the workforce (years)														
≥18	231	75.5	75	24.5	306	100.0	0.590	243	77.6	70	22.4	313	100.0	0.311
≥14 and<18	184	73.3	67	26.7	251	100.0		166	72.2	64	27.8	230	100.0	
<14	60	78.9	16	21.1	76	100.0		45	72.6	17	27.4	62	100.0	
Time in the nursing profession (years)														
<6	63	76.8	19	23.2	82	100.0	<0.001	72	75.8	23	24.2	95	100.0	0.014
6–10	88	61.5	55	38.5	143	100.0		93	66.9	46	33.1	139	100.0	
11–15	89	80.2	22	19.8	111	100.0		81	71.1	33	28.9	114	100.0	
≥16	235	79.1	62	20.9	297	100.0		208	80.9	49	19.1	257	100.0	
Contract type of main employer														
Formal contract in a private institution	250	76.5	77	23.5	327	100.0	0.608	220	72.1	85	27.9	305	100.0	0.105
Civil servant	165	74.3	57	25.7	222	100.0		179	79.9	45	20.1	224	100.0	
Others	60	71.4	24	28.6	84	100.0		55	72.4	21	27.6	76	100.0	
Working sector														
Hospital	234	77.5	68	22.5	302	100.0	0.112	215	71.0	88	29.0	303	100.0	0.014
Primary health care	89	69.0	40	31.0	129	100.0		94	77.0	28	23.0	122	100.0	
Emergency service	55	82.1	12	17.9	67	100.0		40	70.2	17	29.8	57	100.0	
Others	97	71.9	38	28.1	135	100.0		105	85.4	18	14.6	123	100.0	
Main job														
Direct patient care	280	71.8	110	28.2	390	100.0	0.017	310	74.0	109	26.0	419	100.0	0.368
Others	195	80.2	48	19.8	243	100.0		144	77.4	42	22.6	186	100.0	
Holding a second job														
No	324	75.2	107	24.8	431	100.0	0.909	307	78.1	86	21.9	393	100.0	0.017
Yes	151	74.8	51	25.2	202	100.0		147	69.3	65	30.7	212	100.0	
Working at night shift (1st and/or 2nd job)														
No	353	75.1	117	24.9	470	100.0	0.947	343	76.9	103	23.1	446	100.0	0.076
Yes	122	74.8	41	25.2	163	100.0		111	69.8	48	30.2	159	100.0	
Total weekly working hours														
Not informed	24	85.7	4	14.3	28	100.0	0.520	24	96.0	1	4.0	25	100.0	0.1
40–59	157	76.2	49	23.8	206	100.0		155	74.5	53	25.5	208	100.0	
60–79	194	73	70	27	264	100.0		175	73.5	63	26.5	238	100.0	
≥80	100	74.1	35	25.9	135	100.0		100	74.6	34	25.4	134	100.0	
Work injury or work-related illness														
No	406	82.5	86	17.5	492	100.0	<0.001	329	78.1	92	21.9	421	100.0	0.008
Yes	69	48.9	72	51.1	141	100.0		125	67.9	59	32.1	184	100.0	
Total	475	75.0	158	25.0	633	100.0		454	75.0	151	25.0	605	100.0	

* Chi square test

Table 3. Distribution of controls and cases according to working conditions, Nursing workers, São Paulo State, 2019

Variable	Impaired work ability							Intention to leave nursing profession						
	Controls		Cases		Total		p*	Controls		Cases		Total		p*
	nº	%	nº	%	nº	%		nº	%	nº	%	nº	%	
Demands at work														
Lower	76	87.4	11	12.6	87	100.0	0.004	59	83.1	12	16.9	71	100.0	0.095
High	399	73.1	147	26.9	546	100.0		395	74.0	139	26.0	534	100.0	
Control at work														
High	419	77.3	123	22.7	542	100.0	0.001	378	75.8	121	24.2	499	100.0	0.381
Low	56	61.5	35	38.5	91	100.0		76	71.7	30	28.3	106	100.0	
Social support at work														
High	438	76.8	132	23.2	570	100.0	0.002	409	79.9	103	20.1	512	100.0	<0.001
Low	37	58.7	26	41.3	63	100.0		45	48.4	48	51.6	93	100.0	
Demand/control ratio														
Low	207	87.3	30	12.7	237	100.0	<0.001	158	86.8	24	13.2	182	100.0	<0.001
Moderate	147	78.6	40	21.4	187	100.0		144	80.0	36	20.0	180	100.0	
High	121	57.9	88	42.1	209	100.0		152	62.6	91	37.4	243	100.0	
Psychosocial work environment														
Low strain	60	85.7	10	14.3	70	100.0	<0.001	48	81.4	11	18.6	59	100.0	0.189
Active job	359	76.1	113	23.9	472	100.0		330	75.0	110	25.0	440	100.0	
Passive job	16	94.1	1	5.9	17	100.0		11	91.7	1	8.3	12	100.0	
High strain	40	54.1	34	45.9	74	100.0		65	69.1	29	30.9	94	100.0	
Job strain														
No	419	77.3	123	22.7	542	100.0	<0.001	378	75.8	121	24.2	499	100.0	0.381
Yes	56	61.5	35	38.5	91	100.0		76	71.7	30	28.3	106	100.0	
Efforts at work														
Low	415	79.8	105	20.2	520	100.0	<0.001	384	83.5	76	16.5	460	100.0	<0.001
High	60	53.1	53	46.9	113	100.0		70	48.3	75	51.7	145	100.0	
Rewards at work														
High	440	78.2	123	21.8	563	100.0	<0.001	405	80.7	97	19.3	502	100.0	<0.001
Low	35	50.0	35	50.0	70	100.0		49	47.6	54	52.4	103	100.0	
Overcommitment														
Low	331	82.1	72	17.9	403	100.0	<0.001	300	88.2	40	11.8	340	100.0	<0.001
High	144	62.6	86	37.4	230	100.0		154	58.1	111	41.9	265	100.0	
Effort-reward imbalance														
No	453	78.1	127	21.9	580	100.0	<0.001	414	80.4	101	19.6	515	100.0	<0.001
Yes	22	41.5	31	58.5	53	100.0		40	44.4	50	55.6	90	100.0	
Effort-reward ratio														
Low	233	88.6	30	11.4	263	100.0	<0.001	187	91.7	17	8.3	204	100.0	<0.001
Moderate	164	71.6	65	28.4	229	100.0		160	80.0	40	20.0	200	100.0	
High	78	55.3	63	44.7	141	100.0		107	53.2	94	46.8	201	100.0	
Work-related activities that lead do pain and/or injury														
Low	205	86.9	31	13.1	236	100.0	<0.001	162	82.7	34	17.3	196	100.0	<0.001
Moderate	143	73.3	52	26.7	195	100.0		159	78.7	43	21.3	202	100.0	
High	127	62.9	75	37.1	202	100.0		133	64.3	74	35.7	207	100.0	
Total	475	75.0	158	25.0	633	100.0		454	75.0	151	25.0	605	100.0	

* Chi square test

3.90), effort-reward imbalance (OR=2.82, 95% CI=1.44–2.75), high overcommitment (OR=1.77, 95% CI=1.14–2.75), work-related activities that may contribute to job-related pain and/or injury with high (2.58, 95% CI=1.51–4.40) or moderate (OR=1.82, 95% CI=1.06–3.14) exposure, age group of 31 to 40 years (OR=0.26, 95% CI=0.14–0.47) or ≥41 years (OR=0.27, 95% CI=0.15–0.49), degree education (OR=2.13, 95% CI=1.15–3.95) or high school/primary education (OR=1.67, 95% CI=1.05–2.67)and sedentarism (OR=1.74, 95% CI=1.15–2.66). The model was controlled for gender, and residuals analysis showed good fit (χ^2=1.81; p=0.986) (Table 4).

Multiple logistic regression analysis showed that the independent variables associated with intention to leave were: demand/control ratio indicating high exposure to psychosocial risk for job strain (OR=1.81, 95% CI=1.18–2.76), effort-reward imbalance (OR=3.25, 95% CI=1.93–5.47), work-related activities that may contribute to work-related pain and/or injury with high exposure (1.54, 95% CI=1.00–2.35), age group ≥41 years (OR=0.50, 95% CI=0.33–0.77), presence of insomnia symptoms (OR=2.72, 95% CI=1.65–4.47) and female gender (OR=2.70, 95% CI=1.58–4.62). The residuals analysis showed good fit (χ^2=2.48; p=0.963) (Table 5).

Discussion

The study results showed an association between work ability and intention to leave. This behavior in nursing is supported by the existing literature[4, 7, 22], where individuals with impaired work ability have a greater likelihood of giving up work, including before statutory retirement age[10, 23]. The decision to leave the nursing profession is preceded by intention to leave, which in turn is influenced by a range of underlying factors, such as cumulative or sudden exposures, consequences on private life, besides personal and macrosocial conditions, health and pension systems and the job market[4].

In the present study, the factors associated with work ability impairment and intention to leave were analyzed. Several factors were common to both outcomes: high psychosocial risk for job strain, effort-reward imbalance, exposure to situations that may contribute to musculoskeletal pain/injury, and younger age. Overcommitment, lower professional qualifications and sedentarism were associated with impaired work ability, whereas insomnia symptoms

Table 4. Multiple logistic regression analysis of factors associated with impaired work ability, Nursing workers, São Paulo State, 2019

Variables	OR	95% CI (OR)		*p*
		Inf.	Sup.	
Demand/control ratio				
Low	1.00			
Moderate	1.28	0.73	2.23	0.396
High	2.26	1.32	3.90	0.003
Effort-reward imbalance				
No	1.00			
Yes	2.82	1.44	5.52	0.002
Overcommitment				
Low	1.00			
High	1.77	1.14	2.75	0.011
Work-related activities that lead do pain and/or injury				
Low	1.00			
Moderate	1.82	1.06	3.14	0.031
High	2.58	1.51	4.40	0.001
Age (years)				
≤30	1.00			
31–40	0.26	0.14	0.47	<0.001
≥41	0.27	0.15	0.49	<0.001
Nursing education				
College education with postgraduate degree	1.00			
College education	2.13	1.15	3.95	0.016
High /Elementary school	1.67	1.05	2.67	0.030
Regular practice of physical activity				
Yes	1.00			
No	1.74	1.15	2.66	0.010

The model was adjusted for gender. Hosmer-Lemshow test: χ^2=1.81; p=0.986.

Table 5. Multiple logistic regression analysis of factors associated with intention to leave nursing profession, Nursing Workers, São Paulo State, 2019.Paulo State, 2019

	OR	95% CI (OR)		*p*
		Inf.	Sup.	
Demand/control ratio				
Low / moderate	1.00			
High	1.81	1.18	2.76	0.006
Effort-reward imbalance				
No	1.00			
Yes	3.25	1.93	5.47	<0.001
Work-related activities that lead do pain and/or injury				
Low / moderate	1.00			
High	1.54	1.00	2.35	0.048
Age (years)				
≤40	1.00			
≥41	0.50	0.33	0.77	0.002
Insomnia				
No	1.00			
Yes	2.72	1.65	4.47	<0.001
Sex				
Female	1.00			
Male	2.70	1.58	4.62	<0.001

Hosmer-Lemshow test: χ^2=2.48; p=0.963.

and male gender were also associated with intention to leave.

Of the sociodemographic factors assessed, higher age proved protective against work ability impairment and intention to leave. The association between age and work ability may be absent or non-linear, since aspects such as qualifications, coping capacity and working conditions can be more favourable among older workers, thereby protecting their work ability[2, 10]. With regard to intention to leave, there is evidence that younger adults are more exposed to tasks involving higher physical load, content and limited autonomy, low pay and greater interest in pursuing new professional avenues, whereas older individuals face greater difficulties finding a new job[2, 4, 24]. A study of nurses in Brazil found age to be a protective factor for leaving the profession[24]. The effect of worker health should also be taken into account, with early exit of individuals with disability, poorer health or who are submitted to greater workloads[2, 24].

No association between sex and work ability was found in the present study, but men had higher risk of intention to leave. This absence of association between gender and work ability has been reported in previous studies, where factors such as working conditions proved more relevant[23]. The gender association with intention to leave was also observed in previous studies, showing that men more often wish to change profession[4, 24], possibly because males in nursing can feel professionally frustrated by aspects such as choice and low recognition of the profession, as well clashes with colleagues and clients, leading to dissatisfaction and consequent intention to leave[24].

Sedentary individuals had higher risk of work ability impairment, echoing findings of a study on nursing professional at a private hospital in São Paulo[25]. Engagement in physical activity helps prevent impairment and enhance work ability[25, 26]. The protective role of exercise can be explained by preservation of musculoskeletal and cardiorespiratory capacity, control of body weight, attenuation of emotional reactions to stress, and improvement in self-esteem[26, 27]. However, this same association was not seen for intention to leave, which tends to be more impacted by job pressure factors and by attraction through external incentives[4].

Insomnia was not associated with work ability impairment on the multiple model for job variables, but represented greater risk for intention to leave. Insomnia is associated with daytime sleepiness and fatigue, inability to perform complex tasks, impacting performance, job turnover, absenteeism and job dissatisfaction, potentially leading to intention to leave[28]. A study of Greek nurses found that insomnia was associated with burnout, emotional exhaustion, depersonalization and limitation in personal restrictions[29].

Level of professional qualifications was associated with work ability, but not with intention to leave. Impaired work ability was more frequent in individuals with primary or high school education and, to a greater degree, among those

holding a graduate degree versus a post-graduate degree. Professionals educated to high school/primary level are generally nursing assistants or technicians, categories that perform predominantly care-related tasks involving high physical and mental load, favouring the occurrence of musculoskeletal and mental health disorders with consequent work ability impairment[2]. Nursing professionals holding degrees, but not post-graduate qualifications, are typically engaged in both patient care and administration duties. This group enjoys less autonomy than professionals with post-graduate qualifications, who hold more senior management or institutional posts[24]. These loads, determined by working conditions and organizational environment, can favour impairment of work ability.

External work-related factors create loads and stresses which can favour work ability impairment and intention to leave[4]. In the present study, several stressors of the psychosocial and physical work environment were associated with these outcomes, evidencing a dose-response relationship, with worse outcomes correlating with increased exposure to stressors.

The high demand-control ratio, representing greater exposure to psychosocial risk for job strain, was associated with higher risk for both work ability impairment and intention to leave. According to the demand-control model, jobs characterized by high psychosocial demands and low control favour the occurrence of psychosocial stress[16]. The resultant burnout has a deleterious effect on physical and mental health, impairing work ability and encouraging attempts to avoid these situations through intention to leave[2, 4]. Other nursing studies have shown similar results, even after adjusting for other potential confounders[2, 24].

The risk for work ability impairment and intention to leave was greater among those professionals with more marked effort-reward imbalance. ERI was especially relevant for these two outcomes, even when assessed alongside other job stressors[2, 30]. Imbalance between effort and reward represents a risk for the occurrence of physical and mental health problems and reflects aspects of social reciprocity, pointing to the need for interventions centered on rewards in terms of esteem, recognition, and possibilities for development and career[4]. These results are in line with those of other studies in Brazil investigating work ability[2] and intention to leave[24].

Professionals displaying overcommitment had higher risk for work ability impairment, but this factor showed no association with intention to leave. Individuals exhibiting overcommitment can underestimate work demands while overestimating their resources to cope, maximizing the effects of stress and rendering them more susceptible to exhaustion and sickness and consequent impairment in work ability[4]. In inadequate work situations, this individual pattern intrinsic to motivation is reinforced by external pressure[4, 18]. Similar results documented in other nursing studies reflect the impairment profile characterizing these professionals[2].

Greater exposure to situations that may contribute to musculoskeletal pain or injury was a risk for work ability impairment and for intention to leave, confirming results of earlier studies[2, 22]. The high physical loads of nursing are determinants of physical problems, particularly musculoskeletal disorders, leading to impaired work ability[2, 4, 31]. The NEXT-Study found a clear association between lifting and bending activities and intention to leave, a phenomena more prevalent among nurses with higher level of disability, given that professionals with good health status are more resilient to a high level of exposure to physical tasks[4].

In this study, individual characteristics (sociodemographic, lifestyle), particularly those related to the physical and psychosocial work environment, were associated with work ability impairment. Excessive physical and/or mental work increases susceptibility to disease, with consequent limitation in the ability to perform work activities, contributing to voluntary exit from the job or otherwise, and predicting intention to leave[2]. An assessment of the constructive model describing the "House of Work Ability" showed that work-related issues explained over 30% of work ability variance[1]; in the NEXT-Study, around 20% of work ability variance was explained by working conditions, predominantly work organizational factors[4]. These are adverse pressure factors that make workers wish to leave their job in its present form, favoring intention to leave[4].

The study results corroborate previous reports, providing fresh insights while highlighting the need to promote individual resources and improve conditions of the physical and psychosocial work environment as a strategy for enhancing work ability and retaining professionals in the workforce. The study limitation: the target population was nursing professionals living in the state of Sao Paulo, Brazil. Thus, the results of this study may be applicable to locations with similar socioeconomic conditions to those here described. The work ability impairment and the intention to leave are especially relevant when we consider that the nursing profession plays a vital role in the health systems[7–9, 31].

The scarcity of nursing professionals and evasion in search of better conditions are prevalent problems in both developed and developing countries. The inadequate work-

ing conditions and the lack of recognition and professional perspectives are at the root of this problem[2, 4, 7, 32]. These issues are cause for concern in the context of demographic aging and the increased burden on health services, together with a dwindling interest in taking up the profession[4, 8, 31].

The sheer number of psychosocial job factors impacting health, work ability and intention to leave is noteworthy, aspects which should be embraced in preventive and corrective practices. Recommended strategies include reducing workloads and optimizing resources, such as quality of leadership, opportunities for development, staffing levels and recognition[4, 7, 31].

Conclusions

This study showed that individual characteristics, particularly inadequate working conditions, were associated with work ability impairment and intention to leave. Preventive public and institutional policies should include measures that promote improvements in the physical and psychosocial work environment, as well as strengthening individual resources.

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