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Who retires early and why? Determinants of early retirement pension among Danish employees 57–62 years

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Abstract The aim of this study was to identify demographic characteristics and occupational determinants of transition from employment to voluntary early retirement pension (ERP). A questionnaire-based survey among 365 employees in Denmark 57–62 years was performed in 2000, with a register-based follow-up 4 years later. Early retirement was associated with increasing age, and lower socioeconomic position. There were weak associations between gender and ERP. Low skill discretion, high conflict in work and two measures of uncomfortable work positions significantly increased the risk of ERP. The study shows that more than half of the eligible population makes use of voluntary ERP, and further indicates a potential for reducing the amount of older employees utilizing this labour market exit option through reducing certain physical and psychosocial exposures in the work environment, independent of age, gender, and socioeconomic position.

Keywords Early retirement pension · Longitudinal · Psychosocial · Physical · Denmark

Introduction

As in most other OECD countries, the age of retirement from work in Denmark is decreasing. At the same time, demographic forecasts predict a need for employment in the future due to an aging workforce. This together will result in a shortage of qualified labour in the labour markets in most western countries. Prevention of expulsion from working life and limiting different types of early retirement is receiving

still more attention from different research fields including epidemiology, medicine, psychology and social sciences. A way for research to approach the multi-factorial nature of retirement is through adapting an analytical distinction between push, pull and jump explanations (Kolberg 1991). Push explanations focus on individual level factors causing the employee to leaving the labour market (Trommel and de Vroom 1994). Pull explanations derive from economical sciences, and presume retirement to be voluntary, as the decision of leaving work is caused by an economical advantage in retiring (Wadensjö 1985; Wise 1997; Siddiqui 1997). Jump explanations resemble pull explanations in the presumption of retirement being voluntary, but here retirement is not based on an economical rationale, but rather on the individuals wish for self-realisation and self-activation in “the third age” (Jensen and Kjeldgaard 2002). These three different explanations will often overlap each other (Halvorsen 1994). The present study does not aim at encompassing dimensions of all three explanations, but will focus on identifying potential push factors related to the individual employees work environment.

There seems to be general agreement in the literature on the following associations between workplace factors and work disability: heavy physical labour (Borg and Burr 1997; Krause et al. 1997, 2001; Andersson et al. 1983; Danchin et al. 1982; Dasinger et al. 2000; Høgelund 2000; Lanier and Stockton 1998; Mackenzie et al. 1998; Rønnevik 1988), repetitive or continuous strain, musculoskeletal strain, uncomfortable working position, and crouching (Krause et al. 1997), bending, twisting or working in fixed positions (Bergquist-Ullman and Larsson 1977), and construction work (Cheadle et al. 1994). All in all, the literature provides broad evidence that high job demands of various forms constitute an important determinant for work disability and disability retirement, while the scientific evidence directly linking occupational factors and more voluntary early retirement is far more scarce: the Danish unemployment insurance system offers the opportunity of retiring at the

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age of 60, instead of the normal retirement age of 65 (67 for those aged 60 before July 1st 1999). This is called early retirement pension (ERP). When the voluntary ERP option was introduced in 1978, it was intended primarily as an option of retirement for mainly blue collar workers with physically strenuous jobs. It was supposed to facilitate an exit option prior to onset of work disability related to high strain jobs and furthermore driven by a labour market situation with an overabundance of labour: The secondary aim was to create more jobs for young people by letting older employees retire voluntarily.

The relation between ERP and work environment factors has so far been the subject of only one study. The authors found an association between low skill discretion in work and having a spouse, and transition to ERP. However, the study by Lund and colleagues was conducted on a cohort of male waste collectors, and therefore not representative for the general working population (Lund et al. 2001).

The aim of this study is to identify occupational push factors for transition from employment to voluntary ERP among the general working population 57–62 years, taking into account sociodemographic characteristics known to affect the risk of related outcomes.

Methods

Study population

The study is based upon the database DWECs/DREAM. This is a merge between the Danish Work Environment Cohort Study (DWECs) and a national register on social transfer payments (DREAM). DWECs features a sample of 5,357 employees aged 18–69 interviewed in 2000 regarding work environment exposures, age, gender, cohabitation, occupation, and education. The DWECs cohort is representative of the Danish working population (Burr et al. 2003). The cohort was followed up in the DREAM register from January 1st 2001 to December 31st 2004. DREAM contains information on all social transfer payments for all citizens in Denmark since mid-1991, including granted ERP.

At the time of this study, the Danish unemployment insurance system offered the opportunity of retiring at the age of 60, instead of the normal retirement age of 65 (67 for those aged 60 before July 1st 1999). Hence, the relevant population for this study consists of employees aged between 57 and 62 at baseline. Altogether 395 employees fulfilled this criterion. During the 4-year follow-up period, two persons had emigrated, three received permanent disability pension, six had died and nineteen received permanent, mandatory, old age pension. They were excluded from the analysis, leaving 365 persons as the basis for analysis in this study.

Outcome

The outcome of this study, ERP, was defined as receiving ERP during the period from January 1st 2001 to December 31st 2004, according to DREAM.

Determinants

Sociodemographic characteristics

The study includes data on gender and age of the individual employee and whether or not the concerned person was living with a partner. Socioeconomic position was defined based on employment grade, job title and education yielding five categories: I: executives and/or academics, II: middle managers and/or having more than 3–4 years of further education, III: other white collar workers, IV: skilled blue collar workers, and V: semi- or unskilled blue collar workers.

Psychosocial work environment determinants

Psychosocial work environment determinants were measured with 39 items combined into 11 scales. The scales measured decision authority, skill discretion (measuring employee development possibilities in work), emotional demands, demands of bottling up emotions, job insecurity, social support from co-workers and supervisor, management quality, reward in work, meaning of work, predictability in work, and conflicts at work. The scale characteristics measured on the specific study population are described in Table 1. The scale items and response categories are described elsewhere (Lund et al. 2005).

Physical work environment determinants

Physical work environment determinants were measured with seven questions combined into three indices. Three indices measured uncomfortable work positions: extreme bending or twisting of the neck or back, work with arms lifted or hands twisted, and working mainly standing or squatting (Lund and Csonka 2003). The mean scores, standard deviations and ranges of the three indices are shown in Table 2.

All psychosocial scale and physical index scores ranged from 0 to 100.

Finally, intensity of quantitative demands was measured with a single question: ‘Do you have to work very fast?’ The response options were: ‘always’, ‘often’, ‘sometimes’, ‘seldom’, or ‘never/hardly ever’.

Analysis

To examine the relationship between baseline determinants and ERP at follow-up, logistic regression methods

Table 1 Characteristics for scales measuring psychosocial work environment determinants

Scale	Mean	SD	Range	No. of items	Cronbachs α	Inter-item correlation (range)
Decision authority	49.1	26.7	0–100	4	0.72	0.32–0.51
Skill discretion	74.5	19.2	0–100	4	0.74	0.29–0.46
Emotional demands	28.4	25.1	0–100	3	0.88	0.67–0.72
Demands of bottling up emotions	21.6	22.0	0–100	2	0.54	0.38
Job insecurity	15.0	23.7	0–100	4	0.60	0.18–0.34
Social support	68.3	24.7	0–100	4	0.74	0.29–0.61
Management quality	60.7	21.1	0–100	4	0.84	0.48–0.60
Reward	64.6	17.3	0–100	3	0.49	0.20–0.27
Meaning	81.7	16.0	0–100	3	0.78	0.51–0.59
Predictability	66.8	22.4	0–100	2	0.70	0.53
Conflicts at work	4.1	12.1	0–100	4	0.46	0.08–0.41

were used to calculate odds ratios (ORs) and 95% confidence intervals (95% CI).

In order to facilitate interpretation of determinant effect sizes in the regression analysis, the 11 psychosocial scales, the 3 physical indices, and the single item question measuring intensity of qualitative demands were multiplied by a factor 0.1 before entering the regression model. The ORs for these measures thus express the change of one (1) unit on a range from 0 to 10.

The analysis of sociodemographic characteristics was performed in two consecutive steps: the first step presents unadjusted risk estimates for each sociodemographic characteristic, whereas the second step presents the results of their mutual adjustment.

The analysis of psychosocial and physical determinants was performed in three consecutive steps: model I presents risk estimates adjusted for gender, age and cohabitation, model II further adjusts each separate psychosocial determinant for all physical determinants, and each separate physical determinant for all psychosocial determinants. Model III further adjusts for socioeconomic position.

We chose to adjust for socioeconomic position separately in the final step, as the job-component in this variable is a proxy for work environment, and, therefore, we risk controlling the work environment determinants for themselves. The estimates in this third step are, therefore, conservative.

The SAS procedure PROC GENMOD (SAS version 8.02) was used to perform the logistic regression analyses.

Table 2 Mean scores, standard deviation (SD), and range of indices measuring physical work environment determinants

Index	Mean	SD	Range
Extreme bending/twisting of neck/back	12.6	19.3	0–100
Working with arms lifted/hands twisted	9.7	16.3	0–100
Working mainly standing/squatting	22.9	20.5	0–100

n = 365

Results

During the 4-year follow-up period, 209 employees (57%) received permanent ERP. Of these, 103 were women (50%) and 106 men (50%). A total of 156 (43%) had remained in work. Of those still working, 134 (86%) were still employed, 18 (11%) unemployed or in supported employment, and 4 (3%) were temporarily sick-listed at the time of follow-up.

There were no significant differences between male and female employees in receiving ERP. The excess risk of female gender was borderline significant both when unadjusted ($P=0.07$) and when adjusted for age, cohabitation, and socioeconomic position ($P=0.09$). Age showed a significant association with transition to ERP over time, as odds would increase with increasing age. This association was also significant when taking into account effects of gender, cohabitation and socioeconomic position. There was no significant association between cohabitation and transition to ERP. We found a clear association between socioeconomic position and ERP: people categorized as other white collar workers (III), skilled blue collar workers (IV), or semi- or unskilled blue collar workers (V) had significantly increased odds of ERP compared to those categorized as executives and/or academics (I). There were no significant differences between the middle managers and/or those having more than 3–4 years of further education (II) and the executives and/or academics (I) (Table 3).

With regard to work environment determinants, analyses adjusted for the sociodemographic characteristics of gender, age and cohabitation showed increased risk of ERP when exposed to low skill discretion, low decision authority, high job insecurity, high conflict in work, extreme bending/twisting of the neck/back, and working mainly standing/squatting (Table 4, model I). Further adjustment of the psychosocial determinants for physical determinants, and physical determinants for psychosocial determinants, caused the predictive abilities of decision authority and job insecurity to become insignificant (Table 4, model II).

Table 3 Sociodemographic characteristics of ERP

Determinant	Level	n	Unadjusted			Mutually adjusted		
			OR	95% CI	P	OR	95% CI	P
Gender	Female	165	1.47	0.97–2.24	0.07	1.49	0.93–2.40	0.09
	Male	200	1			1		
Age	OR pr 1 year increase		1.31	1.14–1.51	<0.00	1.34	1.16–1.56	<0.00
Cohabitation	Yes	290	1.02	0.61–1.77	0.94	1.07	0.61–1.87	0.82
	No	74	1			1		
Socioeconomic Position	V	67	2.48	1.20–5.13	0.01	2.39	1.12–5.09	0.02
	IV	43	3.06	1.33–7.01	<0.00	3.49	1.48–8.24	<0.00
	III	128	2.63	1.39–5.00	<0.00	2.63	1.33–5.22	<0.00
	II	66	1.23	0.60–2.52	0.57	1.14	0.54–2.44	0.72
	I	57	1			1		

n = 365

Final adjustment for socioeconomic position did not change this picture, leaving low skill discretion, high conflict in work, extreme bending/twisting of the neck/back, and working mainly standing/squatting as significant work environment determinants of ERP when taking into account other work environment exposures, age, gender, cohabitation and socioeconomic position (Table 4, model III).

Discussion

During follow-up, 209 out of 365 persons (57%) received permanent ERP. The study showed an excess risk of ERP with increasing age and among those in the lowest three of five socioeconomic strata. Those with work exposing them to low skill discretion, high conflict

in work, extreme bending/twisting of the neck/back, and working mainly standing/squatting, were more likely to be retired by means of ERP than those less exposed to these four work environment factors. These results are based on a representative cohort of 57–62 year-old employees in Denmark featuring a prospective design with a 4-year follow-up period. Though the cohort is representative, one should have in mind the relatively small sample size when interpreting the risk estimates. The baseline was questionnaire-based, whereas the outcome was established using register data: this eliminates possible common method variance and the related positive bias (Spector 1987; Williams et al. 1989). The study comprises information on both physical, psychosocial work environment exposures, and a number of socio-demographic variables. However, the study does not encompass all factors relevant to the retirement

Table 4 Work environment determinants of ERP

Determinant	Model I ^a			Model II ^b			Model III ^c		
	OR	95%CI	P	OR	95% CI	P	OR	95% CI	P
Low decision authority	1.08	1.00–1.17	0.04	1.07	0.99–1.15	0.10	1.04	0.96–1.14	0.29
Low skill discretion	1.09	1.00–1.18	0.05	1.10	1.02–1.23	0.04	1.09	1.00–1.19	0.05
High emotional demands	1.04	0.96–1.13	0.33	1.03	0.94–1.12	0.48	1.00	0.91–1.11	0.89
High demands of bottling up emotions	1.06	0.96–1.17	0.26	1.07	0.97–1.19	0.17	1.09	0.98–1.21	0.10
High job insecurity	1.11	1.01–1.24	0.04	1.08	0.97–1.21	0.14	1.08	0.97–1.21	0.17
Low social support	1.02	0.94–1.10	0.66	1.02	0.94–1.11	0.61	1.02	0.94–1.10	0.67
Poor management quality	1.06	0.96–1.16	0.26	1.05	0.95–1.17	0.30	1.05	0.94–1.16	0.34
Low reward in work	1.03	0.90–1.16	0.65	1.06	0.93–1.21	0.32	1.08	0.94–1.24	0.23
Low meaning in work	1.13	0.98–1.31	0.08	1.06	0.91–1.23	0.41	1.03	0.88–1.21	0.68
Low predictability in work	1.07	0.97–1.17	0.14	1.03	0.94–1.14	0.47	1.03	0.93–1.13	0.54
High conflict in work	1.38	1.07–1.79	0.01	1.39	1.06–1.84	0.01	1.43	1.08–1.90	0.01
Intensive qualitative demands	1.06	0.98–1.14	0.11	1.06	0.98–1.15	0.11	1.06	0.97–1.15	0.14
Extreme bending/twisting of neck/back	1.25	1.09–1.43	<0.00	1.24	1.07–1.44	<0.00	1.20	1.03–1.40	0.01
Work with arms lifted/hands twisted	1.14	0.99–1.31	0.06	1.11	0.96–1.29	0.17	1.08	0.93–1.26	0.30
Working mainly standing/squatting	1.28	1.06–1.43	<0.00	1.28	1.13–1.44	<0.00	1.26	1.10–1.43	<0.00

ORs for an increase of one unit on scales/indices/single item question ranging 0–10. N = 365

^aEach determinant adjusted for gender, age and cohabitation

^bEach separate psychosocial determinant further adjusted for all physical determinants, each separate physical determinant further adjusted for all psychosocial determinants

^cEach determinant further adjusted for socioeconomic position

process. We were only able to address a small fraction of the work related push factors, taking into account only a small part of the sociodemographic dimension: This study does not consider the effects of, for example, private supplementary pension schemes, behavioural factors, or health, or how these factors interact with the associations we have established in this study.

The findings in this study indicate that ERP in the new millennium is chosen by more than half of the working population above 60, but as originally intended, the highest incidences are still in the lower socioeconomic strata. We found no associations between cohabitation and use of ERP. This finding was not expected, as previous studies have indicated, to state that having a spouse can act as a pull-factor from work in later career years. However, the study documenting this effect was performed among a strictly blue collar, male population (Lund et al. 2001).

With regard to work environment exposures, the present finding of ERP being more prevalent when exposed to extreme bending/twisting of neck/back, or working mainly standing/squatting suggests an overlap between determinants of ERP and permanent work disability retirement: several studies point out heavy manual labour (Borg and Burr 1997; Krause et al. 1997, 2001; Andersson et al. 1983; Danchin et al. 1982; Dasinger et al. 2000; Høgelund 2000; Lanier and Stockton 1998; Mackenzie et al. 1998; Rønnevik 1988), repetitive or continuous strain, musculoskeletal strain, uncomfortable working position, and crouching, (Krause et al. 1997) and bending, twisting or working in fixed positions (Bergquist-Ullman and Larsson 1977) as determinants of retirement due to work disability. This overlap could reflect that ERP is used as an exit option before physical work strain develops into work disability.

In the literature, psychosocial determinants of work disability are: low worker control over the job and, especially, over the work and rest schedule, long work hours, high psychological job demands, monotonous work, low skill discretion, and high job stress or job strain (Krause et al. 1997, 2001). Job dissatisfaction has been found to be positively associated with work disability in some studies (Krause et al. 1997; Bergquist-Ullman and Larsson 1977), but not in others (Krause et al. 2001; Mackenzie et al. 1998). Low job seniority is consistently associated with longer duration of work disability also after controlling for age (Dasinger et al. 2000; Krause et al. 2001; Johnson and Ondrich 1990). The results of this study indicates, that some of the same psychosocial exposures predicting work disability also have an effect on ERP, which might reflect the possibility for employees to retire before a specific exposure causes health problems resulting in work disability as suggested for the physical determinants.

The results of this study are largely in concordance with the results of the relatively few other studies featuring a similar outcome. A survey among members of the Danish trade union for unskilled male workers formerly known as SiD (now part of the trade union for

unskilled female and male workers; Fælles Fagligt Forbund, 3F) concluded that influence on and freedom in work and the possibility to enhance one's skills through supplementary training were over-represented among members choosing to stay in work compared to those who chose ERP (SiD 1998). Borg and Burr (1997) found a strong association between low skill discretion and ERP similar to the present study (Borg and Burr 1997). This study's finding of similar abilities for the measure of skill discretion suggests, that this applies for the senior part of the working population in general. In a population of male waste collectors and municipal workers in Denmark, Lund and colleagues found no association between psychosocial work environment exposures and ERP. They found ERP to be predicted by ergonomic exposures, and, as mentioned above, by having a spouse (Lund et al. 2001). The latter could reflect the voluntary nature of this outcome, but was not confirmed by this study.

This study showed that voluntary ERP is used by more than half the eligible population, with an excess incidence among blue collar, and lower white collar workers. The study indicates a potential for reducing the amount of older employees utilizing ERP as a labour market exit option by reducing the risks associated with bending and twisting the upper back and performing non-sedentary work. Designing jobs with rotation of tasks could be considered. Also, important is providing development possibilities in work in the latter part of working life, for instance, through design and promotion of supplementary training programs specifically targeting the needs of the senior employees.

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