Original article

Scand J Work Environ Health. 2017;43(3):234–240. doi:10.5271/sjweh.3624

Organizational change, psychosocial work environment, and non-disability early retirement: a prospective study among senior public employees

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Breinegaard N, Jensen JH, Bonde JP. Organizational change, psychosocial work environment, and non-disability early retirement: a prospective study among senior public employees. *Scand J Work Environ Health*. 2017;43(3):234–240. doi:10.5271/sjweh.3624

Objective This study examines the impact of organizational change and psychosocial work environment on non-disability early retirement among senior public service employees.

Methods In January and February 2011, Danish senior public service employees aged 58–64 years (N=3254) from the Capital Region of Denmark responded to a survey assessing psychosocial work environment (ie, social capital, organizational justice, and quality of management). Work-unit organizational changes (ie, change of management, merging, demerging, and relocation) were recorded from January 2009 to March 2011. Weekly data on non-disability early retirement transfer were obtained from the DREAM register database, which holds weekly information about all public benefit payments in Denmark. Hazard ratios (HR) for early retirement following employees' 60th birthday were estimated with Cox regression adjusted for age, gender, and socioeconomic status.

Results Exposure to change of management [HR 1.37, 95% confidence interval (95% CI) 1.13−1.66], mergers (HR 1.23, 95% CI 1.02−1.48), and relocation of work unit (HR 1.24, 95% CI 1.01−1.54) increased rate of non-disability early retirement, while demerging of work unit did not (HR 1.03, 95% CI 0.79−1.33). Work units with lower levels of social capital (HR 1.22, 95% CI 1.05−1.41), organizational justice, (HR 1.18, 95% CI 1.04−1.32), and quality of management (HR 1.14, 95% CI 1.02−1.25) increased rate of early retirement.

Conclusion Organizational change and poor psychosocial work environment contribute to non-disability early retirement among senior public service employees, measured at work-unit level.

Key terms ageing; Denmark; organizational restructuring; older worker; public sector; retirement behavior.

Life expectancy is increasing and at the same time, birth rates are stagnating and people enter the labor market at an older age as a larger proportion of the population pursues higher education. As a consequence, the old-age dependency ratio is growing, and a potential policy to address the resulting pensions crisis is to motivate senior employees to remain economically active longer and reduce voluntary early retirement (1).

Previous research has identified a number of factors affecting individual retirement decisions. Economic factors have been found to play a major role (2) and empirical evidence suggests that poor health causes workers to retire earlier (3–5). However, a recent systematic review of 29 studies conclude that self-reported health, chronic disease and mental health plays a marginal role for early retirement when not granted on health grounds (6). Qualitative studies have indicated that retirement decisions are affected by major life events like illness or death in the immediate social circle (7) and other social circumstances, especially a retiring spouse (8, 9).

The work environment is also assumed to affect individual retirement decisions. A demanding physical work environment can cause employees to retire earlier, but several studies have also linked the psychosocial work environment to early retirement (7, 10). Organizational changes causing job insecurity, like down-sizing, have been associated with adverse health outcomes and disability pension (11–15), but when focus is on voluntary retirement, even minor organizational changes may play a role. Limited attention has been devoted to the potential effects of the psychosocial work environment and organizational change in retaining healthy senior employees (16–18).

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In the period 2011–2012, the nominal pension age in Denmark was 65 years when the government-paid old-age pension could be claimed and, before the age of 65, retirement was possible via disability or early retirement benefit. Disability benefit could be received in the age range 18–64 years, mainly on health grounds (mental as well as physical). Eligibility for early retirement benefit is unrelated to health and could be claimed from the age of 60–64 by anyone insured for a long time in an unemployment insurance fund. At the end of 2012, 34% of women and 27% of men aged 60–64 years received early retirement benefit.

The primary aim of this study was to investigate how organizational change is related to subsequent transition to early retirement benefit. A secondary aim was to investigate how the psychosocial work environment affects early retirement and the association between organizational change and early retirement.

Methods

Study sample and design

This study was a prospective cohort study of employees in the Capital Region of Denmark, and the study endpoint was retirement through the early retirement benefit program. The source population was all employees in the Capital Region of Denmark who were invited to participate in a questionnaire-based survey of well-being and work environment from 12 January 2011 to 9 February 2011. Among a total of 35 560 employees, 28 820 (81%) responded to the survey. Employees were organized in 2761 work units, where a work unit is defined as a group of employees with reference to a specified manager or head of unit. Data on organizational change from 1 January 2009 to 31 March 2011 were collected via an internet-based survey, in which all heads of work units were contacted (response rate 68.5%). The final study population included employees eligible for early retirement benefit, ie, aged 60–64 years for at least one week during the follow-up period from 4 April 2011 to 31 December 2012.

The study sample comprised 3254 employees after excluding those who were already retired or had died before start of follow-up, were employed in a flexible job (for people with reduced ability to work), or had missing values on the baseline covariates,

Organizational change and the psychosocial work environment

Data on organizational change included information about change of management, merging, demerging, and relocation. Data were recorded at the work-unit level and linked to each employee in the work unit.

In the well-being and work environment survey, 44 items were related to the psychosocial work environment of the work unit. Altogether, 35 items were retrieved from the Copenhagen Psychosocial Questionnaire, second version (19), and the regional human resource departments, management, and employee representatives edited the remaining convenience questions. Since psychosocial work environment was not measured using established and validated scales, a research group including three specialists in occupational medicine categorized selected items into three composite scales for purposes of the present analyses. Survey items about the psychosocial work environment were all ordinal with 5 or 7 response categories. Three composite scales of psychosocial work environment were constructed: (i) organizational justice (6 items, Cronbach's α 0.89), (ii) quality of management (4 items, Cronbach's α 0.86), and (iii) social capital (8 items, Cronbach's α 0.84) (see appendix for construction of scales, www.sjweh.fi/index.php?page=data-repository). The scales ranged from 0–100 with higher values representing a more positive evaluation of the psychosocial work environment.

In the present study, we focused on an aggregated measure of psychosocial work environment within work units, where employees were expected to have similar psychosocial working conditions rather than individual perceptions. Individual-level scores were computed as the mean of non-missing item responses and rescaled to 0–100 and work-unit-level scores were subsequently computed as the mean score for each work-unit and assigned to all employees within that unit, including non-respondents. The work-unit-level scores were based on responses from all employees of all ages and recorded as missing if data were available for <50% of items (individual level) or employees (work-unit level). Table 1 shows the distribution of work units and employees by work unit size.

Covariates

Age, gender, and socioeconomic factors were potential confounders for the association between the psychosocial work environment and early retirement. From the region's registers we obtained information on work-unit affiliation,

Table 1. Number of employees distributed by work-unit size.

	Number of employees in unit				
	1–5	6–15	16–30	>30	Total
Employees all ages	2575	13 102	10 674	9209	35 560
Respondents	2256	10 473	9238	6853	28 820
Employees 60–64 years	360	1549	1460	865	4234
Employees in study sample	241	1241	1066	706	3254

occupational group, and gender for all participants. This information was linked to national registers containing information on age (continuous), gross personal income in 2010, gross household income in 2010, hospitalization in 2010 (yes/no), and civil status (single/married). Income categories were formed by dividing participants into four groups of approximately equal size.

Non-disability early retirement

Data on non-disability early retirement were obtained from the DREAM database, which holds weekly information about all public benefit payments in Denmark. For each participant, we recorded the first week receiving early retirement benefit. Participants who turned 65 years, died, emigrated, were on long-term sick-leave or started a flexi-job were censored.

Statistical analysis

Participants were followed from 4 April 2011 or their 60th birthday, whichever came last, to first payment of early retirement benefit, censoring or end of study, whichever came first. We estimated hazard ratios (HR) and 95% confidence intervals (95% CI) using Cox proportional hazards regression to study the association between early retirement and (i) organizational change, and (ii) psychosocial work environment using work-unit mean values.

The association between each of the four binary (organizational change) and three continuous (psychosocial work environment) explanatory variables and the outcome was evaluated in separate Cox regression models. All analyses were adjusted for age by setting the time scale in the Cox regression to weeks since 60th birthday of the participant. We performed crude Cox regression analyses (adjusted for age only) and adjusted Cox regression analyses (adjusted for age, gender, and socioeconomic status). Finally, the associations between each type of organizational change and early retirement were adjusted for all psychosocial work environment scales in addition to baseline covariates, and vice versa.

Results

Table 2 shows the distribution of the study population on levels of covariates and occurrence of organizational change or early retirement for corresponding groups of employees. Among the 2206 employees where we had information about all types of organizational changes, 65.1% experienced one or more organizational changes in the two-year follow-up period. Organizational change was most frequent among social and healthcare workers (74.9%) and least frequent among laboratory technicians (46.0%) and technical/service staff (54.1%). During the follow-up period, 525 women (21%) and 117 men (14%) retired early. Retirement was frequent (17–26%) among all occupational groups except medical doctors and dentists (2%).

Table 2. Distribution of the study sample and the prevalence of organizational change and early retirement across covariate levels.

	Total		Experienced change		Retired	
	N	%	N	%	N	%
Gender						
Female	2446	75.2	1078	65.8	525	21.5
Male	808	24.8	366	64.4	117	14.5
Age at 4 April 2011 (years)						
58–59	1181	36.3	525	67.2	204	17.3
60–61	1468	45.1	658	64.6	386	26.3
62–63	329	10.1	130	60.7	38	11.6
64	276	8.5	131	68.2	14	5.1
Medical diagnosis in 2010						
Yes	1396	42.9	617	64.7	276	19.8
No	1858	57.1	827	66.0	366	19.7
Civil status						
Single	1079	33.2	478	66.3	168	15.6
Married/cohabiting	2175	66.8	966	65.1	474	21.8
Occupational group						
Nurses	654	20.1	316	70.9	138	21.1
Medical doctors & dentists	344	10.6	153	64.8	7	2.0
Social & healthcare workers	463	14.2	236	74.9	129	27.9
Other healthcare workers	348	10.7	172	70.8	60	17.2
Laboratory technicians	242	7.4	74	46.0	52	21.5
Administrative staff	755	23.2	314	66.2	136	18.0
Technical/service staff	448	13.8	152	54.1	120	26.8
Personal income 2010 (gross, dkr.)						
<325 000	828	25.4	357	62.9	274	33.1
325 000–375 000	817	25.1	360	64.4	181	22.2
375 000–450 000	827	25.4	377	67.3	142	17.2
>450 000	782	24.0	350	67.4	45	5.8
Household income 2010 (gross, dkr.)						
<450 000	943	29.0	402	64.9	188	19.9
450 000–700 000	897	27.6	402	65.8	212	23.6
700 000–950 000	793	24.4	344	63.1	181	22.8
>950 000	621	19.1	296	68.7	61	9.8
All respondents	3254	100	1444	65.5	642	19.7

In crude Cox regression analyses (table 3), we found that the rate of early retirement was significantly higher among employees who experienced change of management, namely a 32% increase (HR 1.32, 95% CI 1.09–1.59). The same was true for employees who experienced merging of units with a 23% increased rate (HR 1.23, 95% CI 1.02–1.48). In adjusted analyses, change of management increased the rate of early retirement by 37% (HR 1.37, 95% CI 1.13–1.66), while the effect of merging work units remained unchanged compared to crude analyses (HR 1.23, 95% CI 1.01–1.49). Employees who experienced relocation of work-unit retired at a 10% higher rate when adjusted only for age and this was not significant (HR 1.10, 95% CI 0.89–1.35) but the rate was 25% higher in the adjusted model (HR 1.25, 95% CI 1.01–1.54). In adjusted models that also included the

Table 3. Crude and adjusted hazard ratios (HR) for early retirement associated with each type of organizational change at the work-unit level. [95% CI=95% confidence interval.]

Type of organizational change	N	%	Crude [a]		Adjusted [b]		Adjusted [c]	
			HR	95% CI	HR	95% CI	HR	95% CI
Change of management	937	42.9	1.32	1.09–1.59	1.37	1.13–1.66	1.27	1.03–1.57
Merging units	901	41.4	1.23	1.02–1.49	1.23	1.01–1.49	1.11	0.90–1.38
Demerging unit	344	15.8	1.01	0.78–1.31	1.03	0.79–1.33	0.98	0.73–1.30
Relocation of unit	609	27.8	1.10	0.89–1.35	1.25	1.01–1.54	1.10	0.87–1.40

[a] Adjusted for age.
[b] Adjusted for age, gender, medical diagnosis, civil status, occupation, personal income, and household income.
c Adjusted for all variables above + psychosocial work environment.

psychosocial work environment scales, the effect of any type of organizational change on subsequent early retirement was attenuated. The HR associated with change of management dropped to 1.27 but remained significant (HR 1.27, 95% CI 1.03–1.57). The HR dropped to 1.11 (95% CI 0.90–1.38) for merging, to 0.98 (95% CI 0.73–1.30) for demerging and to 1.10 (95% CI 0.87–1.40) for relocation of work unit.

Table 4 shows HR for a negative 20-point difference (approximately equal to the interquartile ranges) in the psychosocial work environment scales. In crude analyses, this difference in score on the dimension of social capital was associated with a 19% increase in the rate of early retirement (HR 1.19, 95% CI 1.03–1.37). This increased to 22% in adjusted analyses (HR 1.22, 95% CI 1.05–1.41). Employees in work units with lower levels of organizational justice also had significantly higher rate of early retirement; 12% in the crude analyses (HR 1.12, 95% CI 1.00–1.27) and 18% in the adjusted analyses (HR 1.18, 95% CI 1.04–1.32). Quality of management showed no significant effect on the rate of early retirement when adjusted only for age (HR 1.05, 95% CI 0.95–1.16) but when adjusted for all covariates, the association became significant (HR 1.14, 95% CI 1.02–1.25). When adjusted for the four organizational change indicators as well, a moderate increase was seen in the estimated effect size for all three scales of the individual appraisal of the psychosocial work environment.

Discussion

The adjusted analyses of organizational change provided in this paper showed that Danish senior public employees who experienced change of management, or merging or relocation of work units had a higher rate of early retirement. Demerging of work unit was not related to early retirement. Adjusted analyses of psychosocial work environment showed that poorer social capital and organizational justice and lower quality of management increased the rate of early retirement. After adjusting for these psychosocial factors, the rate of early retirement was still significantly higher among employees who experienced change of management, but the remaining types of organizational change had no significant effect. Adjusting for organizational changes increased the effect of psychosocial work environment on retirement.

Other findings

To the best of our knowledge, the association between workplace organizational change and early retirement not granted by disability or poor health has only been systematically examined in one previous epidemiological study: de Wind et al (8) examined determinants of early retirement in a longitudinal study with one-year follow-up of 2317 Dutch employees aged 59–63 years. While financial possibility and spouse expectations were strong determinants, this study did not reveal increased rate of early retirement in relation to organizational change, which 34% of the participants reported. On the contrary, organizational change associated with compulsory redundancies was related to a decreased rate of early retirement (OR 0.75, 95% CI 0.48–1.17). This finding based upon self-reports seems contrary to results obtained in our study, but the type(s) of organizational change(s) was not specified and the study population differed in terms of job types and gender distribution, limiting comparison.

Mechanisms

A study including qualitative interview data on 30 Dutch employees aged 60–64 who retired early found that organizational change was frequently reported as reasons for early retirement (7). Employees in this study highlighted loss of motivation to continue working due to job routines undergoing continuous changes not perceived as necessary. Organizational change has been found to have negative effects on employee outcomes, such as decreased organizational commitment, job insecurity, and job withdrawal in all ages (20, 21). Moreover, senior employees tend to perceive organizational change as more stressful compared to their younger counterparts (16), which may accelerate the decision to retire early

Table 4. Association between work-unit mean score on psychosocial work environment scale and early retirement. Adjusted hazard ratio (HR) associated with a 20-point decrease on the scale. [IQR=interquartile range; 95% CI=95% confidence interval.]

Scale	N	Mean	IQR	Crude [a]		Adjusted [b]		Adjusted [c]	
				HR	95% CI	HR	95% CI	HR	95% CI
Social capital	2912	67	59–74	1.19	1.03–1.37	1.22	1.05–1.41	1.30	1.09–1.55
Organizational justice	2893	62	53–72	1.12	1.00–1.27	1.18	1.04–1.32	1.27	1.10–1.47
Quality of management	2837	64	54–75	1.05	0.95–1.16	1.14	1.02–1.25	1.21	1.07–1.38

[a] Adjusted for age.
[b] Adjusted for age, gender, medical diagnosis, civil status, occupation, personal income, and household income.
[c] Adjusted for all variables above + organizational change indicators.

(22). In addition, a previous study from our research group (2) investigated factors associated with the "risk" of intending to quit the job if economically possible in a cohort of hospital employees of all ages. Suadicani et al (23) found that employees with intention to quit their job rated the quality of management lower than employees with no intention to quit, which is in line with findings of the present study. However, inclination to quit does not necessarily lead to de facto retirement. Social pressures in the workplace are suggested to be a key factor in limiting employees' decision to exit the labor market (17). Interestingly, demerging of the work unit was not associated with increased risk of early retirement. This could be explained by this type of organizational change being less extensive, since Vahtera et al (24) found that minor organizational changes have fewer adverse health effects than major changes.

Furthermore, organizational changes have been demonstrated to affect the employees' perceived psychosocial work environment (12). In this study, we found that adjusting for psychosocial work environment scales diminished the effect of organizational changes on early retirement. This indicates that part of this effect is due to perceived changes in the psychosocial work environment.

Strengths and limitations

This prospective study employed independent measures of exposure and outcome. Thus we obtained information on organizational change by few specific questions to work-unit managers while information on retirement was retrieved from highly reliable national registers. Selection bias is not an issue since employees were included regardless of their participation in the questionnaire survey and the registers provide complete data. We also consider it a strength that assessment of psychosocial work environment factors such as social capital, organizational justice, and quality of management were based on a work-unit-level approach. Using work-unit means of psychosocial work environment provides aggregated measures that are less affected by individual perceptions, and this can limit reporting bias and is more relevant in identifying risk factors relating to the psychosocial working environment (25, 26). In this particular study, this approach also reduced missingness since non-respondents were assigned the work-unit mean score. Analyses using individual scores on psychosocial work-environment scales showed similar associations, but all estimates were inflated compared to the analyses using work-unit mean scores (results not shown).

Some limitations also need to be acknowledged. First, the variation in the three psychosocial work environment scales was large within work units compared to between units (intra-class correlations 0.17–0.21). Still, the contrast between work units was considerable with an interquartile range spanning some 20–25% and even if disregarding within-unit variation leads to measurement error, risk estimates were not necessarily attenuated (27).

Second, missingness could be a source of bias if non-respondents differed from our study population with respect to work environment or organizational changes as well as the tendency to retire early. We found that the frequency of early retirement did not differ significantly between respondents and non-respondents with respect to organizational changes but that retirement was more frequent with a missing response on all three work-environment scales. If non-respondents would have had a lower score on the scales, this missingness could lead to underestimating the effect of the psychosocial work environment.

Third, ad hoc scales modified from the second version of the Copenhagen Psychosocial Questionnaire (19) were applied to measure the perceived psychosocial work environment, but high alpha-values indicate reliability of the scales.

Fourth, the present study focused on push (or negative) factors related to early retirement, such as poor social capital, organizational injustice, and low quality of management. In contrast to push factors, pull factors are positive considerations increasing the motivation to retire early, such as wish to spend more time with significant others or hobbies (10, 18). The current study would probably have benefitted from data on pull fac-

tors and financial possibilities facilitating early exit from the labor market. Such factors are strong predictors for retirement (8, 9), but since there is no obvious reason to believe that these variables are correlated with the explanatory variables of interest, organizational changes or psychosocial work environment, we argue that this did not cause bias.

Fifth, the study population were predominantly female. This is a characteristic of healthcare employees and generalizations of the results to other parts of the public sector should be made with caution.

In conclusion, the findings of this study indicate that organizational changes in the public sector have potentially strong impact on early retirement among employees older than 60 years of age, independent of disability or poor health, and that efforts to improve the psychosocial work environment during restructuring is important.

Acknowledgements

We would like to thank specialists in occupational medicine Kasper Olesen, PhD, Marianne Borritz, MD, PhD and Nanna Eller, MD, PhD (along with Jens Peter Bonde) for their time and great effort in categorization of items in composite psychosocial work environment scales. Also, we thank data analyst Johan Reventlow for collecting data on organizational change. Finally, we wish to thank employees in the Capital Region of Denmark for their participation in the psychosocial work environment survey. The Capital Region of Denmark and the Danish Working Environment Research Fund are acknowledged for their financial contribution to the study. The sponsors had no role in the planning of the study or the interpretation of the results. All authors state that they have no conflicts of interest.

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Received for publication: 20 May 2016