



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Job satisfaction is more than a fruit basket, health checks and free exercise

Cross-sectional sectional study among 10,000 wage earners

Andersen, Lars L.; Fishwick, David; Robinson, Edward; Wiezer, Noortje M.; Mockao, Zofia; Grosjean, Vincent

Published in:
Scandinavian Journal of Public Health

DOI (link to publication from Publisher):
[10.1177/1403494817698891](https://doi.org/10.1177/1403494817698891)

Creative Commons License
CC BY-NC 4.0

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Andersen, L. L., Fishwick, D., Robinson, E., Wiezer, N. M., Mockao, Z., & Grosjean, V. (2017). Job satisfaction is more than a fruit basket, health checks and free exercise: Cross-sectional sectional study among 10,000 wage earners. *Scandinavian Journal of Public Health*, 45(5), 476-484. <https://doi.org/10.1177/1403494817698891>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- ? Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- ? You may not further distribute the material or use it for any profit-making activity or commercial gain
- ? You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

ORIGINAL ARTICLE

Job satisfaction is more than a fruit basket, health checks and free exercise: Cross-sectional study among 10,000 wage earners

LARS L. ANDERSEN^{1,2}, DAVID FISHWICK³, EDWARD ROBINSON³, NOORTJE M. WIEZER⁴, ZOFIA MOCKAŁŁO⁵ & VINCENT GROSJEAN⁶

¹National Research Centre for the Working Environment, Denmark, ²Physical Activity and Human Performance group, SMI, Department of Health Science and Technology, Aalborg University, Denmark, ³Centre for Workplace Health, Health and Safety Executive, UK, ⁴TNO, The Netherlands, ⁵Central Institute for Labour Protection – National Research Institute, Poland, and ⁶INRS, France

Abstract

Aim: Workers who are satisfied with their job are the cornerstones of healthy and productive companies. This study investigated factors associated with job satisfaction in the general working population. **Methods:** From the 2010 round of the Danish Work Environment Cohort Study, currently employed wage earners ($N=10,427$) replied to questions about work, lifestyle and health. Multinomial logistic regression controlled for sex, age, job group, smoking, body mass index, chronic disease and general health assessed the association between work factors and job satisfaction (very satisfied and satisfied, respectively, with unsatisfied as reference). **Results:** Psychosocial work factors – social support from superiors, social support from colleagues and influence at work – had the strongest association with job satisfaction. For example, for high social support from superiors, the odds ratio (OR) for being very satisfied with the job was 12.35 (95% confidence interval [CI] 8.71–17.51). With sedentary work as reference, the OR for being very satisfied with the job for ‘standing and walking work that is not strenuous’ was 1.57 (95% CI 1.06–2.33), while the opposite was seen for ‘heavy and strenuous work’ with an OR of 0.34 (95% CI 0.18–0.62). Only two out of five types of workplace health-promotion offers (physical exercise and healthy diet) were associated with job satisfaction. For example, for offers of physical exercise the OR for being very satisfied with the job was 1.84 (95% CI 1.33–2.55). **Conclusions:** While psychosocial work factors and to some extent physical work demands are important for job satisfaction, workplace health-promotion offers appear to play a minor role.

Key Words: Job satisfaction, psychosocial work environment, physical work environment, workplace health promotion, physical exercise

Introduction

Workers who are satisfied with their job are the cornerstones of healthy and productive companies.¹ By contrast, poor job satisfaction is associated with mental-health problems such as burn-out, low self-esteem, depression and anxiety.² Prospective studies have shown that poor job satisfaction increases the risk of sickness absence^{3,4} and disability pension.⁵ In certain job groups, for example among nurses, dissatisfaction with work also increases the likelihood of staff turnover^{6,7} and can lead to less organisational

flexibility.⁸ Thus, job satisfaction has consequences for the individual, workplace and society.

Questionnaires are commonly used to assess job satisfaction. The phrasing can be very broad and open for different interpretations, for example a single-item global measure: ‘How satisfied are you with your job in general – all things considered?’ Others have used combinations of several specific questions assessing different characteristics of the job, for example the Warr Job Satisfaction Questionnaire⁹

Correspondence: Lars L. Andersen, National Research Centre for the Working Environment, Lersø Parkalle 105, Copenhagen, Denmark. E-mail: lla@nrcwe.dk

Date received 10 August 2016; reviewed 13 February 2017; accepted 15 February 2017

© Author(s) 2017

Reprints and permissions: sagepub.co.uk/journalsPermissions.nav

DOI: 10.1177/1403494817698891

journals.sagepub.com/home/sjp



SAGE

and the Job Descriptive Index.¹⁰ In the present study, we chose to use the single-item global measure of job satisfaction in order to investigate which underlying factors are associated with job satisfaction. Prior research has identified several associates of job satisfaction, including both individual and organisational factors. A systematic review among health-care workers found empowerment, autonomy, resources and workload to be important for job satisfaction.¹¹ Another systematic review found that good leadership was also important for job satisfaction.¹² However, recent analyses among the general working population are lacking.

Nowadays, many companies offer health promotion at workplaces, such as free exercise or smoking cessation.¹³ Workplace health promotion can broadly be viewed as the combined effort of employers, employees and society to improve the health and well-being of people at work.¹⁴ A systematic review and meta-analysis found that workplace health promotion seemed to improve mental but not physical well-being.¹⁵ However, mental well-being may only be a small part of job satisfaction. Another meta-analysis found that workplace health promotion with physical activities may improve job satisfaction, but that the results should be interpreted with caution due to a small number of studies with mixed results.¹⁶ Therefore, uncertainties still exist over whether workplace health-promotion offers are important for job satisfaction.

Therefore, the aim of this study was to investigate factors associated with job satisfaction in the general working population. We were especially interested in investigating the association between workplace health promotion offers and job satisfaction. For the purpose of the present article, we will consider a limited number of workplace health promotion factors: smoking cessation, healthy diet, physical exercise, contact with health professionals and health checks.

Methods

Population

Data on the work environment and health in the study population were obtained from the 2010 round of the Danish Work Environment Cohort Study (DWECS).^{17–20} This study consists of questionnaires assessing work environment and health in the general working population of Denmark, and has been repeated every five years since 1990. The questions used for this study are specified below. The questionnaire was distributed to a random sample drawn from the Danish Central Population Register of 30,000 people between 18 and 59 years of age who resided in Denmark, of whom two thirds were from

the working population.²¹ A total of 10,605 (~53%) from the working population replied to the 2010 questionnaire. For the present analyses, only currently employed wage earners from the 2010 round were included ($N=10,427$; i.e. self-employed people were excluded). Because not all participants filled in all questions, the exact number for each analysis varied. Table I shows the baseline characteristics of the study population.

Ethical approval

According to Danish law, questionnaire- and register-based studies do not need approval by ethical and scientific committees or informed consent.²² However, the study was notified to and registered by Datatilsynet (the Danish Data Protection Agency; journal number 2007-54-0059). All data were de-identified and analysed anonymously.

Job satisfaction

The outcome variable 'job satisfaction' was determined by the question 'How satisfied are you with your job in general – all things considered?' The four-point response scale was 1='very satisfied', 2='satisfied', 3='unsatisfied' and 4='very unsatisfied'. To gain more statistical power for subsequent statistical analyses, responses that were graded 3 and 4 were collapsed into 'unsatisfied' because only 1.1% responded with a 4.

Explanatory variables

Explanatory variables included psychosocial work factors, physical demands at work and offers of workplace health promotion. These factors were largely chosen based on what previous reviews have found to be important for job satisfaction^{11,12} combined with the availability of questions in the 2010 round of the DWECS that it made sense to include.

Influence at work was determined by two questions. The first question was 'Are you part of organising your own work? (e.g. what to do, how to do it or who to work together with)', with the response options 1='always', 2='usually', 3='usually not' and 4='never'. The second question was 'Do you have a large degree of influence concerning your work?', with the response options 1='always', 2='often', 3='sometimes', 4='seldom' and 5='never/hardly ever'.²³ Subsequently, responses for each of the two questions were normalised on a scale of 0–100 and averaged. Finally, the normalised values were trichotomised into low (0–33.3), moderate (33.3–66.6) and high (66.6–100).

Table I. Characteristics of the participants.

	All			Men			Women		
	N	%	Mean (SD)	N	%	Mean (SD)	N	%	Mean (SD)
Age (years)	10427		43.5 (11.7)	4762		43.7 (11.8)	5665		43.3 (11.6)
Sex									
Men	4762	45.7		4762	100				
Women	5665	54.3					5665	100	
Smoking									
Yes	2356	23.2		1121	24.2		1235	22.3	
Ex-smoker	2916	28.7		1296	28.0		1620	29.2	
No	4897	48.2		2208	47.7		2689	48.5	
Body mass index (kg/m ²)									
Underweight (<18)	86	0.9		15	0.3		71	1.3	
Normal weight (18–25)	5319	52.7		2007	43.6		3312	60.3	
Overweight (25–30)	3399	33.7		1963	42.6		1436	26.2	
Obese (≥30)	1291	12.8		621	13.5		670	12.2	
Job satisfaction									
Very satisfied	4135	40.3		1801	38.5		2334	41.8	
Satisfied	5436	53.0		2558	54.7		2878	51.6	
Unsatisfied	574	5.6		255	5.5		319	5.7	
Very unsatisfied	114	1.1		63	1.4		51	0.9	

Support from colleagues was determined by the questions 'How often do you get help and support from your colleagues?' and 'How often are your colleagues willing to listen to your problems at work?' Support from superiors was determined by the questions 'How often do you get help and support from your nearest superior?' and 'How often is your nearest superior willing to listen to your problems at work?' Response options were 1='always', 2='often', 3='sometimes', 4='seldom' and 5='never/hardly ever'.²³ Subsequently, responses for each respective set of two questions were normalised on a scale of 0–100 and averaged. Finally, the normalised values were trichotomised into low (0–33.3), moderate (33.3–66.6) and high (66.6–100).

Physical demands at work were determined by the question 'How would you generally describe your physical activity in your main job?' The response was given on a four-point scale where 1='mostly sedentary work that does not require physical exertion', 2='mostly standing or walking work which otherwise does not require physical exertion', 3='standing or walking work with some lifting or carrying work', and 4='heavy or fast work which is physically strenuous'.²⁴

Offers of workplace health promotion were determined by the question 'During the last year, have you been offered health promotion via your workplace?', with the six types of health promotion offers being 1='smoking cessation', 2='healthy diet', 3='exercise facilities', 4='weekly exercise activities', 5='contact with health professionals (physiotherapy, psychologist or the like)' and 6='health checks'.²⁰ For

subsequent analysis, options 3 and 4 were collapsed into a 'physical exercise' category. The response categories for each of type of health promotion offers were 1='no', 2='yes, during working hours', and 3='yes, outside working hours'. Subsequently, responses 2 and 3 were collapsed to 'yes'.

Control variables

In addition to estimating the contribution of the explanatory variables, the analysis was controlled for a number of other variables: age (continuous, information from the CPR register), sex (information from the CPR register), smoking habits (non-smoker, ex-smoker, smoker), body mass index (BMI; continuous), job group (information about 86 different job groups delivered by Statistics Denmark, e.g. office workers, school teachers, nurses), self-reported chronic disease (depression, asthma, diabetes, cardiovascular disease, cancer, back disease) and general health.¹⁸ The reason for controlling for job group was that there may be a socio-economic gradient of job satisfaction. The reason for controlling for individual health-related factors (smoking, BMI, chronic disease) was that some of these may be associated with work ability or an increased risk of discrimination in the workplace, which may also influence job satisfaction.

Statistical analyses

Using logistic regression (Proc Logistic, SAS v9.4), odds ratios (OR) and 95% confidence intervals (CI)

Table II. Mutually adjusted ORs (95% CIs) for job satisfaction (very satisfied vs. unsatisfied and satisfied vs. unsatisfied, respectively) from the multinomial logistic regression analysis.

		Very satisfied vs. unsatisfied		Satisfied vs. unsatisfied	
		N	OR (95% CI)	N	OR (95% CI)
Social support from superiors	1. Low (0–33)	247	0.10 (0.06–0.16)	461	0.17 (0.12–0.23)
	2. Moderate (33–66)	1140	1	3008	1
	3. High (66–100)	3275	12.35 (8.71–17.51)	2468	3.35 (2.39–4.68)
Social support from colleagues	1. Low (0–33)	78	0.26 (0.10–0.67)	163	0.42 (0.24–0.73)
	2. Moderate (33–66)	579	1	1352	1
	3. High (66–100)	3976	3.34 (2.46–4.53)	4389	1.54 (1.19–2.01)
Influence at work	1. Low (0–33)	462	0.29 (0.20–0.42)	1002	0.39 (0.29–0.53)
	2. Moderate (33–66)	897	1	2098	1
	3. High (66–100)	3390	5.20 (3.79–7.15)	2880	1.98 (1.47–2.66)
Physical work demands	1. Seated work	2466	1	2532	1
	2. Standing or walking work, not strenuous	1172	1.57 (1.06–2.33)	1364	1.47 (1.02–2.14)
	3. Standing or walking work with lifting	917	0.93 (0.62–1.42)	1679	1.33 (0.91–1.95)
	4. Heavy or fast work, strenuous	180	0.34 (0.18–0.62)	389	0.59 (0.35–0.99)
WHP - Smoking cessation	1. No	3369	1	4423	1
	2. Yes	828	0.92 (0.60–1.41)	899	0.94 (0.63–1.41)
WHP – healthy diet	1. No	3190	1	4228	1
	2. Yes	1005	1.69 (1.10–2.60)	1048	1.93 (1.28–2.92)
WHP – physical exercise	1. No	2584	1	3596	1
	2. Yes	1857	1.84 (1.33–2.55)	2033	1.55 (1.15–2.10)
WHP – health professionals	1. No	2725	1	3723	1
	2. Yes	1649	0.93 (0.68–1.27)	1874	0.80 (0.59–1.07)
WHP – health checks	1. No	3334	1	4425	1
	2. Yes	873	1.01 (0.67–1.55)	924	0.93 (0.62–1.39)

The analysis was controlled for age, sex, job group, smoking habits, body mass index, chronic disease and general health. OR: odds ratio; CI: confidence interval; WHP: workplace health promotion.

were calculated, with job satisfaction as the dependent variable and psychosocial work factors, physical demands at work and offers of workplace health promotion as mutually adjusted independent variables. Logistic regression was chosen because the dependent variable was a categorical variable. Cumulative logistic regression was not possible because the proportional odds assumption was not fulfilled. Thus, we chose to perform a multinomial logistic regression with job satisfaction of ‘unsatisfied’ as the reference category. Finally, exploratory sex-stratified analyses were performed.

Chen et al. compared ORs with effect sizes (Cohen’s *d*) and found that ORs of 1.68, 3.47 and 6.71 correspond to small, medium and large effect sizes, respectively.²⁵ Because we evaluated effects rather than associations, we chose to use the terms ‘weak’, ‘moderate’ and ‘strong’ positive associations for ORs of 1.68, 3.47 and 6.71, respectively. For ORs of <1, the reciprocal of the OR should be considered, that is, ORs of 0.60, 0.29 and 0.15 correspond to weak, moderate and strong negative associations, respectively.

Results

Table I shows that the study population of wage earners was on average 43.5 years old (*SD*=11.7 years), 23% were current smokers and approximately half were of normal weight. The majority (93%) were satisfied or very satisfied with their job.

Table II shows ORs for job satisfaction as a function of psychosocial work factors, physical work demands and offers of workplace health promotion. Of all the factors of the present study, the most important for being ‘very satisfied’ with the job were, in descending order, high social support from superiors, high influence at work and high social support from colleagues, with ORs between 3 and 12 corresponding to moderate to strong positive associations. Similarly, low social support from superiors, low influence at work and low social support were associated (lower odds) with being ‘very satisfied’, also with moderate to strong negative associations. The strength of association for the psychosocial factors was in general less pronounced for being ‘satisfied’ with the job, with associations from weak to moderate.

Table III. Stratified analysis with men only: mutually adjusted ORs (95% CIs) for job satisfaction (very satisfied vs. unsatisfied and satisfied vs. unsatisfied, respectively) from the multinomial logistic regression analysis.

		Very satisfied vs. unsatisfied		Satisfied vs. unsatisfied	
		N	OR (95% CI)	N	OR (95% CI)
Social support from superiors	1. Low (0–33)	125	0.08 (0.04–0.17)	233	0.16 (0.10–0.25)
	2. Moderate (33–66)	505	1	1425	1
	3. High (66–100)	1403	14.29 (8.08–25.26)	1131	4.02 (2.32–6.98)
Social support from colleagues	1. Low (0–33)	33	0.08 (0.02–0.45)	75	0.30 (0.12–0.75)
	2. Moderate (33–66)	282	1	640	1
	3. High (66–100)	1716	3.84 (2.40–6.15)	2053	2.00 (1.32–3.01)
Influence at work	1. Low (0–33)	211	0.17 (0.09–0.32)	457	0.20 (0.12–0.33)
	2. Moderate (33–66)	331	1	890	1
	3. High (66–100)	1547	3.35 (2.00–5.61)	1463	1.22 (0.76–1.96)
Physical work demands	1. Seated work	1107	1	1175	1
	2. Standing or walking work, not strenuous	463	3.12 (1.62–6.01)	549	2.08 (1.12–3.88)
	3. Standing or walking work with lifting	414	0.90 (0.47–1.74)	824	1.08 (0.59–1.99)
	4. Heavy or fast work, strenuous	98	0.54 (0.22–1.30)	249	0.74 (0.35–1.59)
WHP – smoking cessation	1. No	1523	1	2156	1
	2. Yes	341	0.90 (0.45–1.81)	388	0.92 (0.48–1.79)
WHP – healthy diet	1. No	1389	1	2008	1
	2. Yes	492	2.03 (1.02–4.05)	530	2.54 (1.31–4.91)
WHP – physical exercise	1. No	1179	1	1805	1
	2. Yes	777	2.65 (1.55–4.55)	830	1.93 (1.16–3.20)
WHP – health professionals	1. No	1200	1	1791	1
	2. Yes	746	0.66 (0.40–1.08)	873	0.54 (0.34–0.87)
WHP – health checks	1. No	1447	1	2084	1
	2. Yes	450	1.15 (0.59–2.23)	480	1.10 (0.58–2.07)

The analysis was controlled for age, job group, smoking habits, body mass index, chronic disease and general health.

For the physical work demands with sedentary work as reference, standing or walking work that is not strenuous was positively associated both with being ‘satisfied’ and ‘very satisfied’ with the work, but the associations were weak. Heavy or fast work that is strenuous was negatively associated (lower odds) with being both ‘satisfied’ and ‘very satisfied’ with the work, and the associations were weak to moderate.

Two out of five types of workplace health promotion offers – physical exercise and healthy diet – were positively but weakly associated with being ‘satisfied’ and ‘very satisfied’ with the job. The other three workplace health promotion offers – smoking cessation, health checks and contact with health professionals – were not associated with job satisfaction. A subgroup analysis including only current and previous smokers did not change the result for offers of smoking cessation. A subgroup analysis including only workers with one or more chronic diseases did not change the result for offers of health checks and contact with health professionals.

Tables III and IV shows the sex-stratified analyses. For the psychosocial factors, high influence at work appeared to have a stronger positive association with

job satisfaction among women than it did among men. Thus, the estimate of each did not overlap with the CI of the other, although the two CIs did overlap. Testing the final model of Table II with influence by sex interaction instead of sex stratification revealed that the difference was real ($p=0.0393$). For physical work demands, there was a weak to moderate positive association between standing or walking work that is not strenuous and being ‘satisfied’ and ‘very satisfied’ among men but not among women. By contrast, heavy or fast work that is strenuous had a moderate negative association (lower odds) with being ‘satisfied’ and ‘very satisfied’ with the job among women but not among men. However, an interaction analysis of the final model of Table II did not confirm that sex significantly interacted with physical work demands ($p=0.1272$). For the workplace health-promotion offers, associations appeared to be less pronounced among women than they were among men, that is, for women, only physical exercise were positively associated with job satisfaction. However, interaction analyses of the final model of Table II with each of the health promotion offers by sex did not confirm that sex influenced the associations ($p=0.15–0.99$).

Table IV. Stratified analysis with women only: mutually adjusted ORs (95% CIs) for job satisfaction (very satisfied vs. unsatisfied and satisfied vs. unsatisfied, respectively) from the multinomial logistic regression analysis.

		Very satisfied vs. unsatisfied		Satisfied vs. unsatisfied	
		N	OR (95% CI)	N	OR (95% CI)
Social support from superiors	1. Low (0–33)	122	0.10 (0.05–0.20)	228	0.16 (0.10–0.25)
	2. Moderate (33–66)	635	1	1583	1
	3. High (66–100)	1872	12.27 (7.73–19.49)	1337	3.11 (2.00–4.84)
Social support from colleagues	1. Low (0–33)	45	0.50 (0.15–1.61)	88	0.36 (0.16–0.78)
	2. Moderate (33–66)	297	1	712	1
	3. High (66–100)	2260	3.48 (2.26–5.38)	2336	1.39 (0.96–2.02)
Influence at work	1. Low (0–33)	251	0.31 (0.19–0.52)	545	0.48 (0.32–0.72)
	2. Moderate (33–66)	566	1	1208	1
	3. High (66–100)	1843	7.36 (4.67–11.59)	1417	2.74 (1.79–4.21)
Physical work demands	1. Seated work	1359	1	1357	1
	2. Standing or walking work, not strenuous	709	0.99 (0.58–1.70)	815	1.16 (0.70–1.92)
	3. Standing or walking work with lifting	503	0.97 (0.54–1.73)	855	1.51 (0.89–2.58)
	4. Heavy or fast work, strenuous	82	0.20 (0.07–0.52)	140	0.41 (0.18–0.93)
WHP – smoking cessation	1. No	1846	1	2267	1
	2. Yes	487	0.99 (0.56–1.75)	511	1.02 (0.59–1.74)
WHP – healthy diet	1. No	1801	1	2220	1
	2. Yes	513	1.42 (0.79–2.54)	518	1.54 (0.88–2.67)
WHP – physical exercise	1. No	1405	1	1791	1
	2. Yes	1080	1.66 (1.08–2.54)	1203	1.55 (1.04–2.31)
WHP – health professionals	1. No	1525	1	1932	1
	2. Yes	903	1.07 (0.69–1.65)	1001	0.93 (0.62–1.40)
WHP – health checks	1. No	1887	1	2341	1
	2. Yes	423	0.95 (0.52–1.72)	444	0.85 (0.49–1.49)

The analysis was controlled for age, job group, smoking habits, body mass index, chronic disease and general health.

Discussion

The main finding of this cross-sectional study is that while psychosocial work factors and to some extent physical work demands are important for job satisfaction, workplace health-promotion offers appear to play a minor role.

Of all the factors in the present study, social support from superiors showed the strongest association with job satisfaction. Likewise, social support from colleagues was also important for job satisfaction. These findings are congruent with Brough and Pears²⁶ and may be rooted in fundamental characteristics of human beings as social individuals, and are very likely to reflect ideal workplace cultures. In other words, workers with support from their colleagues and superiors are per se more likely to be working in organisations that have invested time and energy into developing their workplace culture and/or have attracted inherently good superiors. Social support can also be viewed as a resource to deal better with demands such as workplace stressors. Influence at work was also important for job satisfaction. These findings are congruent with a previous systematic review among health-care workers that found

empowerment and autonomy to be important for job satisfaction.¹¹ Interestingly, the associations for all three psychosocial factors were stronger for being ‘very satisfied’ than for being ‘satisfied’ with the job. This may reflect that building a good psychosocial working environment is especially important for creating workplaces where the employees are satisfied beyond average with their job, although this may also be a statistical phenomenon occurring when comparing the extreme ends of the scale.

Physical work demands were also associated with job satisfaction, although to a less extent than the psychosocial factors. Thus, those with heavy or fast work had moderately lower odds of being very satisfied with their job, which is congruent with findings showing increased risk of ill health from heavy physical work.^{27,28} On the other hand, those with standing or walking work had a higher chance of being satisfied with their job than those with seated work, although the positive association was weak. Based on these results, optimal physical working conditions for job satisfaction should include some movement but limit the heavy and fast work that is physically strenuous. This finding is also interesting seen in the light of

the increasingly widely adopted view that purely seated work is less healthy than work associated with some physical activity.²⁹

Interestingly, offers of workplace health promotion played only a minor role in relation to job satisfaction. Thus, of the five types of workplace health-promotion offers, only physical exercise and healthy diet were positively associated with job satisfaction, but even then it was only to a weak extent. A meta-analysis from 2009 found that workplace physical activity interventions may improve job satisfaction, but the results of that analysis should be interpreted with caution due to the small number of studies with mixed results.¹⁶ Placing these previous findings into context of each workplace is also difficult. For example, the extent to which traditional workplace health hazards and risks (e.g. dust exposure, poor physical working environments) were controlled was not known. These factors may influence views on health-promotion activities, if basic obligations relating to health risks at work have not yet been addressed. Subsequently, a randomised controlled trial with workplace health promotion, in terms of neck-shoulder strength training together with colleagues during working hours, found positive effects for musculoskeletal symptoms but not for job satisfaction.³⁰ A recent randomised controlled trial found improved social capital within teams at the workplace following 10 weeks of strength training together with colleagues compared with strength training performed alone at home, although the effect sizes were small.³¹ Altogether, the present study along with previous findings suggests that workplace health-promotion offers may only have a small influence on job satisfaction in the general working population. Thus, classical psychosocial factors, and to some extent physical work demands, seem to dominate the perception of job satisfaction. Another factor to consider is that a poor psychosocial working environment can be strong barrier to participate in workplace health promotion with physical exercise.³² Consequently, workplace health promotion should build on a good working environment.

We also performed sex-stratified analyses of job satisfaction. Although many similar findings between men and women were obtained, there also appeared to be differences. For the psychosocial factors, high influence at work appeared to have a stronger association with job satisfaction among women than it did among men. This was confirmed by an interaction analysis. While the literature is scarce in this respect concerning the general working population in different countries, some studies in specific job groups have found that influence at work can be equally important for job satisfaction among men

and women.³³ Thus, the sex-specific findings in the general working population of the present study may not apply to all countries and job groups. For physical work demands, heavy or fast work that is strenuous had a moderate negative association with job satisfaction among women but not among men. However, because there was no significant interaction, this may have been due to chance. For the workplace health-promotion offers, only physical exercise was associated with job satisfaction among both men and women. Offers of a healthy diet were only associated with job satisfaction among men, but there was no significant interaction. It should be remembered that the sex-stratified analyses were exploratory, and some random findings may have occurred. Thus, future studies should investigate whether the sex-related differences in the present study are general findings.

This study has both strengths and limitations. The statistical analyses estimated ORs, which resulted in higher estimates than for risk ratios (RRs). Thus, the results cannot be directly compared with RRs. The cross-sectional study design limits causal inferences to be derived from the results. It can be argued that job satisfaction is inherently a part of the psychosocial and physical working environment, and therefore more closely related to these factors than to workplace health promotion. A limitation related to the generalisability of the results is that the study population came exclusively from the Danish workforce. This European country ranks highest in European surveys on workplace satisfaction and has a relatively low level of unemployment in comparison with some other European countries such as Spain, Greece or France. Furthermore, sex inequality is relatively low in Denmark compared with many other countries,³⁴ and the sex-stratified analyses of the present study may therefore not reflect important factors for job satisfaction for men and women in general across Europe. Macroeconomic and societal conditions such as unemployment rate, degree of unionisation and average wage levels play a role in job satisfaction.³⁵ Future studies should consider between-country differences. For example, wage and job security are important factors in some but not all countries,³⁶ and this may lead to differences in the ranking of major factors influencing job satisfaction. Only 53% of the random sample from the Danish working population replied to the questionnaire. A previous non-response analysis showed that the response rate differed between different groups, for example higher for women than men and higher for job groups of longer education.²¹ However, a robustness analysis showed that these differences only influenced how different job groups rated their working environment

to a minor extent.²¹ Furthermore, because the present analysis of associations was mutually controlled for a number of factors, non-response bias is unlikely to have influenced the results to any relevant extent. Furthermore, the large and representative sample of wage earners from the general working population of Denmark is a strength.

In conclusion, in the general working population, psychosocial work factors were most important for job satisfaction. Of the five types of workplace health-promotion offers, only physical exercise and healthy diet were associated with being satisfied with the job, and only played a minor role in being very satisfied with the job. Thus, while psychosocial work factors and to some extent physical work demands are important for job satisfaction, workplace health-promotion offers generally appear to play a minor role.

Acknowledgements

The authors are grateful to colleagues Elsa Bach and Ebbe Villadsen at NRCWE for assistance with access to data from the Danish Work Environment Cohort Study. All authors are members of the PEROSH Well-being and Work group (www.perosh.eu/research-projects/perosh-projects/well-being-and-work/). This publication and the work it describes were co-funded in terms of working hours spent by each author by respective institutions. Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect the policy of the institutions.

Funding

This work received no grant from any funding agency in the public, commercial or not-for-profit sectors.

Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

References

- [1] Arnold AE, Coffeng JK, Boot CRL, et al. The relationship between job satisfaction and productivity-related costs: A longitudinal analysis. *J Occup Environ Med* 2016;58:874–879.
- [2] Faragher EB, Cass M and Cooper CL. The relationship between job satisfaction and health: A meta-analysis. *Occup Environ Med* 2005;62:105–112.
- [3] Hoogendoorn WE, Bongers PM, de Vet HC, et al. High physical work load and low job satisfaction increase the risk of sickness absence due to low back pain: Results of a prospective cohort study. *Occup Environ Med* 2002;59:323–328.
- [4] Nakata A, Takahashi M, Irie M, et al. Job satisfaction, common cold, and sickness absence among white-collar employees: A cross-sectional survey. *Ind Health* 2011;49:116–121.
- [5] Labriola M, Feveile H, Christensen KB, et al. The impact of job satisfaction on the risk of disability pension. A 15-year prospective study. *Scand J Public Health* 2009;37:778–780.
- [6] Bergman R, Eckerling S, Golander H, et al. Staff composition, job perceptions, and work retention of nursing personnel in geriatric institutions. *Int J Nurs Stud* 1984;21:279–293.
- [7] Parsons SK, Simmons WP, Penn K, et al. Determinants of satisfaction and turnover among nursing assistants. The results of a statewide survey. *J Gerontol Nurs* 2003;29:51–58.
- [8] Eaton SC. Beyond ‘unloving care’: Linking human resource management and patient care quality in nursing homes. *Int J Hum Resour Manag* 2011;11:591–616.
- [9] Warr P. The measurement of well-being and other aspects of mental health. *J Occup Psychol* 1990;63:193–210.
- [10] Kinicki AJ, Mckee-Ryan FM, Schriesheim CA, et al. Assessing the construct validity of the job descriptive index: A review and meta-analysis. *J Appl Psychol* 2002;87:14–32.
- [11] Squires JE, Hoben M, Linklater S, et al. Job satisfaction among care aides in residential long-term care: A systematic review of contributing factors, both individual and organizational. *Nurs Res Pract* 2015;2015:157924.
- [12] Kuoppala J, Lamminpaa A, Liira J, et al. Leadership, job well-being, and health effects – a systematic review and a meta-analysis. *J Occup Environ Med* 2008;50:904–915.
- [13] Andersen LL, Proper KI, Punnett L, et al. Workplace health promotion and wellbeing. *Sci World J* 2015;2015:606875.
- [14] European Network for Workplace Health Promotion. The Luxembourg Declaration on Workplace Health Promotion in the European Union, http://www.enwhp.org/fileadmin/rs-dokumente/dateien/Luxembourg_Declaration.pdf (2007, accessed 3 May 2016).
- [15] Kuoppala J, Lamminpaa A and Husman P. Work health promotion, job well-being, and sickness absences – a systematic review and meta-analysis. *J Occup Environ Med* 2008;50:1216–1227.
- [16] Conn VS, Hafdahl AR, Cooper PS, et al. Meta-analysis of workplace physical activity interventions. *Am J Prev Med* 2009;37:330–339.
- [17] Andersen LL and Garde AH. Sleep problems and computer use during work and leisure: Cross-sectional study among 7800 adults. *Chronobiol Int* 2015;32:1367–1372.
- [18] Calatayud J, Jakobsen MD, Sundstrup E, et al. Dose-response association between leisure time physical activity and work ability: Cross-sectional study among 3000 workers. *Scand J Public Health* 2015;43:819–824.
- [19] Jørgensen MB, Villadsen E, Burr H, et al. Does employee participation in workplace health promotion depend on the working environment? A cross-sectional study of Danish workers. *BMJ Open* 2016;6:e010516.
- [20] Nabe-Nielsen K, Garde AH, Clausen T, et al. Does workplace health promotion reach shift workers? *Scand J Work Environ Health* 2015;41:84–93.
- [21] Bach E, Andersen LL and Bjørner JB. Arbejdsmiljø og helbred i Danmark, www.arbejdsmiljoforskning.dk/da/nyheder/arkiv/2011/samlet-rapport-om-arbejdsmiljoe-og-helbred-i-danmark-2010 (2010, accessed October 20, 2016).
- [22] Committee System on Biomedical Research Ethics. Guidelines about Notification, <http://www.nvk.dk/forsker/naar-du-anmelder> (2011, accessed 3 March 2017).
- [23] Pejtersen JH, Kristensen TS, Borg V, et al. The second version of the Copenhagen Psychosocial Questionnaire. *Scand J Public Health* 2010;38:8–24.
- [24] Hein HO, Suadicani P and Gyntelberg F. Ischaemic heart disease incidence by social class and form of smoking: the Copenhagen Male Study – 17 years’ follow-up. *J Intern Med* 1992;231:477–483.
- [25] Chen H, Cohen P and Chen S. How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Commun Stat Simul Comput* 2010;39:860–864.

- [26] Brough P and Pears J. Evaluating the influence of the type of social support on job satisfaction and work related psychological well-being. *Int J Organ Behav* 2004;8: 472–485.
- [27] Coenen P, Gouttebarga V, van der Burght AS, et al. The effect of lifting during work on low back pain: A health impact assessment based on a meta-analysis. *Occup Environ Med* 2014;71:871–877.
- [28] Andersen LL, Fallentin N, Thorsen SV, et al. Physical workload and risk of long-term sickness absence in the general working population and among blue-collar workers: Prospective cohort study with register follow-up. *Occup Environ Med* 2016;73:246–253.
- [29] Thorp AA, Kingwell BA, Owen N, et al. Breaking up workplace sitting time with intermittent standing bouts improves fatigue and musculoskeletal discomfort in overweight/obese office workers. *Occup Environ Med* 2014;71:765–771.
- [30] Roessler KK, Rugulies R, Bilberg R, et al. Does work-site physical activity improve self-reported psychosocial workplace factors and job satisfaction? A randomized controlled intervention study. *Int Arch Occup Environ Health* 2013;86:861–864.
- [31] Andersen LL, Poulsen OM, Sundstrup E, et al. Effect of physical exercise on workplace social capital: cluster randomized controlled trial. *Scand J Public Health* 2015;43:810–818.
- [32] Andersen LL. Influence of psychosocial work environment on adherence to workplace exercise. *J Occup Environ Med* 2011;53:182–184.
- [33] Vlosky RP and Aguilar FX. A model of employee satisfaction: gender differences in cooperative extension. *J Extension* 2009;47:1–15.
- [34] European Commission. Gender equality, <http://ec.europa.eu/justice/gender-equality/> (accessed November 3, 2016).
- [35] Pichler F and Wallace C. What are the reasons for differences in job satisfaction across Europe? Individual, compositional, and institutional explanations. *Eur Sociol Rev* 2009;25:535–549.
- [36] Sousa-Poza A and Sousa-Poza AA. Well-being at work: A cross-national analysis of the levels and determinants of job satisfaction. *J Soc Econ* 2000;29:517–538.