Table 11.2 Studies of high or moderate quality used for results and
conclusions in the present report – symptoms of burnout.

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Ahola et al 2007 [85] Finland	Prospective cohort study	Participants were members of the Finnish Dental Association. Study aimed at investigating members employed in clinical work	**Job strain** Job strain was assessed by a self-questionnaire; the Job Content Questionnaire by Karasek	**Burnout** Outcome was assessed by a self-questionnaire	Prospective association of job strain at baseline for new cases of burnout at 3-year follow-up. Adjusted for gender, age, and marital status at baseline. OR (95% CI)	Prospective association of job strain at baseline for new cases of burnout at 3-year follow-up. Adjusted for gender, age, and marital status at baseline – and for burnout and depression respectively at baseline. OR (95% CI)
	3 years			Burnout was assessed by the Maslach Burnout Inventory (MBI)	**Women** Job strain and burnout: 4.87 (2.46; 9.64)	**Women** Job strain and burnout: 3.99 (1.99; 7.99)
Study quality High	Dentists 2003–2006	n=2 555 at follow-up (3 255 at baseline)			**Men** Job strain and burnout: 27.87 (6.46; 120.2)	**Men** Job strain and burnout: 22.31 (5.08; 98.07)
		1 883 women and 672 men at baseline				

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Bakker et al 2000 [121] The Netherlands **Study quality** Moderate	Prospective cohort 5 years Health care 1991–1996	Participants were random sample drawn from an official registration system of Dutch general practitioners. Participants were active as practitioners both at baseline and at follow-up Mean age 47 years n=207 44 women and 255 men participated at baseline and follow-up. The exact number, after deleting persons with missing data, is not stated	**Demands** Patient demands were assessed using an adapted version of a scale developed by Mechanic (1970) Lack of reciprocity in relationships with patients was assessed using three items developed by the author	**Emotional exhaustion, depersonali- zation, personal accomplishment** Dimensions of burnout were assessed using the Maslach Burnout Inventory (MBI) at baseline (1991) and follow-up (1996)	Correlations between demands at baseline and the three subscales in the Maslach Burnout Inventory at follow-up. Correlation (Cronbach alpha) **Patient demands, frequency** Emotional exhaustion: 0.20, $p<0.01$ Depersonalization: 0.22, $p<0.01$ Personal accomplishment: −0.11 **Patient demands, burden** Emotional exhaustion: 0.30, $p<0.01$ Depersonalization: 0.20, $p<0.01$ Personal accomplishment: −0.19, $p<0.01$ **Lack of reciprocity** Emotional exhaustion: 0.27, $p<0.01$ Depersonalization: 0.21, $p<0.01$ Personal accomplishment: −0.13	–

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Borritz et al 2005 [132] Denmark **Study quality** Moderate *Note*: Data have only been specified for work-related burnout. The article also presents data on personal burnout and client-related burnout	Prospective cohort 3 years Workers in the human services sector (eg prisons, hospitals, social security offices) Follow-up of the PUMA study 1999–2000, 2002–2003	Participants were recruited from different human service sectors. Mean age 42 years n=952 at follow-up (1 772 at baseline) 1 465 women and 307 men at baseline	**Several psychosocial factors** Psychosocial work charac- teristics were assessed by self- questionnaire. The work characteristics are clustered in four groups: client specific demands, demands at work, work organization and work content, interpersonal relations and leadership Emotional demands were assessed by the Copenhagen Psychosocial Questionnaire (COPSOQ) Work factors were also assessed by questions developed by the author, specified in the article	**Burnout** Burnout was assessed using the Copenhagen Burnout Inventory	Prospective associations for the impact of moving one standard deviation on the psychosocial work characteristics at baseline on the work-related burnout scale 3 years later. Estimate (SE), p-value Model adjusted for age, gender, socioeconomic status, organization, family status, having children <7 years, smoking and exercise at baseline **Personal burnout** *Client-specific work characteristics* Client contact: 3.229 (2.131), p=0.130 Emotional demands: 3.528 (0.566), p<0.0001 Demand for hiding emotions: 2.950 (0.550), p<0.0001 Controlling clients: 0.770 (1.806), p=0.670 *Demands at work* Quantitative demands: 4.273 (0.592), p<0.0001 Work pace: 2.687 (0.592), p<0.0001 *Work organization and job content* Influence at work: −2.919 (0.568), p<0.0001 Possibilities for development: −2.417 (0.592), p<0.0001 Meaning of work: −2.013 (0.585), p=0.001 *Interpersonal relations and leadership* Social support: −0.408 (0.554), p=0.462 Quality of leadership: −1.803 (0.576), p=0.002 Predictability: −2.362 (0.555), p<0.0001 Role clarity: −3.249 (0.556), p<0.0001 Role conflicts: 4.744 (0.555), p<0.0001 *Results continue on the next page*	Prospective associations for the impact of moving one standard deviation on the psychosocial work characteristics at baseline on the work-related burnout scale 3 years later. Estimate (SE), p-value Model adjusted for age, gender, socioeconomic status, organization, family status, having children <7 years, smoking and exercise at baseline. Also mutually adjusted for all psychosocial variables and work-related burnout at baseline **Personal burnout** *Client-specific work characteristics* Client contact: 0.482 (1.866), p=0.796 Emotional demands: 0.303 (0.543), p=0.577 Demand for hiding emotions: −0.310 (0.591), p=0.601 Controlling clients: 0.935 (1.507), p=0.535 *Demands at work* Quantitative demands: 0.391 (0.655), p=0.551 Work pace: 0.172 (0.613), p=0.779 *Work organization and job content* Influence at work: −1.028 (0.551), p=0.063 Possibilities for development: −1.451 (0.646), p=0.025 Meaning of work: 1.356 (0.626), p=0.031 *Interpersonal relations and leadership* Social support: 0.704 (0.507), p=0.165 Quality of leadership: 1.615 (0.650), p=0.013 Predictability: −0.153 (0.577), p=0.790 Role clarity: −1.496 (0.524), p=0.004 Role conflicts: 1.580 (0.565), p=0.005 *Results continue on the next page*

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Continued Borritz et al 2005 [132] Denmark					**Work-related burnout** *Client-specific work characteristics* Client contact: 3.670 (2.424), p=0.130 Emotional demands: 4.636 (0.635), p<0.0001 Demand for hiding emotions: 3.332 (0.622), p<0.0001 Controlling clients: −2.167 (2.044), p=0.289 *Demands at work* Quantitative demands: 5.358 (0.664), p<0.0001 Work pace: 3.827 (0.664), p<0.0001 *Work organization and job content* Influence at work: −3.428 (0.643), p<0.0001 Possibilities for development: −2.454 (0.666), p<0.001 Meaning of work: −2.089 (0.660), p=0.002 *Interpersonal relations and leadership* Social support: −1.366 (0.625), p=0.029 Quality of leadership: −2.876 (0.648), p<0.0001 Predictability: −3.691 (0.622), p<0.0001 Role clarity: −3.407 (0.628), p<0.0001 Role conflicts: 5.130 (0.627), p<0.0001	**Work-related burnout** *Client-specific work characteristics* Client contact: −0.132 (2.224), p=0.953 Emotional demands: −0.301 (0.641), p=0.639 Demand for hiding emotions: 0.431 (0.718), p=0.548 Controlling clients: −0.743 (1.790), p=0.678 *Demands at work* Quantitative demands: −0.089 (0.788), p=0.910 Work pace: 0.667 (0.731), p=0.362 *Work organization and job content* Influence at work: −0.964 (0.654), p=0.141 Possibilities for development: −1.222 (0.765), p=0.111 Meaning of work: 0.949 (0.743), p=0.202 *Interpersonal relations and leadership* Social support: 0.558 (0.605), p=0.356 Quality of leadership: 1.331 (0.771), p=0.081 Predictability: −1.396 (0.682), p=0.041 Role clarity: −0.785 (0.621), p=0.207 Role conflicts: 0.610 (0.674), p=0.366

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Bourbonnais et al 2006 [185] Canada	Before and after quasi-experimental type with a control group	Participants were caregiver personnel in two hospitals; the majority was nurses. Hospitals for intervention and control were comparable in terms of size, hospital setting and type of health care provided (acute care). Population included all health care providers with permanent full or part time and temporary positions and those on call. Care providers on sick leave and those working only two days per week were excluded. Age 18 years or older, most 35–44 years	**Demands, control** Demands and control were assessed by telephone interview using Karasek´s Job Content Questionnaire (JCQ; 18 items)	**Burnout** Burnout was assessed by telephone interview using Copenhagen Burnout Inventory	Comparison of psychosocial work factors and health problems between the experimental and control hospitals. Mean of score at post-intervention adjusted for the pre-intervention measure. Comparison between hospitals (reflected in p-value) calculated by ANCOVA	–
Study quality Comments High *Note*: Study not used for results since the study data focus on describing the effects of an invervention (ie no distinct association between exposure and out come)	Health care 2000–2002		Participants fulfilled questionnaires before and after the intervention There was also a 30 minute telephone interview relating to psychosocial job factors and health Work factors were assessed before and after the intervention		**Psychological demands** Experimental hospital: 12.08 Control hospital: 12.68 p=0.015 **Decision latitude** Experimental hospital: 65.59 Control hospital: 68.06 p: ns **Supervisor support** Experimental hospital: 10.82 Control hospital: 10.42 p=0.028 **Co-worker support** Experimental hospital: 12.49 Control hospital: 12.26 p=0.056	
		n=613 (302 participants at experimental hospital and 311 at control hospital)			**Client-related burnout** Experimental hospital: 36.36 Control hospital: 38.33 p: ns **Work-related burnout** Experimental hospital: 46.66 Control hospital: 49.03 p=0.034 **Personal burnout** Experimental hospital: 43.34 Control hospital: 45.84 p: ns	

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Burke et al 1995 [136] Canada	Prospective cohort 1 year Schools	Participants were school-based educators. Most were teachers; some were department heads or principals. Age	**Psychosocial factors** Work setting characteristics were assessed with self-questionnaires	**Psychological burnout and MBI dimensions** Burnout was assessed with self-questionn-aires based on the Maslach	Relationships between predictors at baseline and psychological burnout at follow-up. R^2, delta R^2, p	–
Study quality Moderate	2000–2002	25 (or younger) to 56 years (or older); most 36–40 years	using questions developed by Cherniss	Burnout Inventory (MBI) and a questionnaire based on the	**Emotional exhaustion (n=256)** Work stressors: 0.27, 0.21, p=0.001 Social support: 0.28, 0.02, p: ns	
		n=362 178 women and	Lack of social support was assessed with self-questionnaires	Cherniss model All participants completed	**Depersonalization (n=254)** Work stressors: 0.25, 0.15, p=0.001 Social support: 0.26, 0.01, p: ns	
		184 men	using questions developed by Caplan et al	questionnaires at baseline and at follow-up	**Lack of personal accomplishment (n=252)** Work stressors: 0.26, 0.22, p=0.001 Social support: 0.26, 0.00, p: ns	
			All questions are listed in the article		**Burnout, total (n=249)** Work stressors: 0.32, 0.24, p=0.001 Social support: 0.34, 0.01, p: ns	

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Burke et al 1995 [135] Canada	Prospective cohort	Participants were school-based educators. Most were teachers; some were department heads or principals. Age 25 (or younger) to 56 years (or older); most 36–40 years	**Psychosocial factors** Work setting characteristics were assessed with self-questionnaires using questions developed by Cherniss	**Psychological burnout and MBI dimensions** Burnout was assessed with self-questionnaires based on the Maslach Burnout Inventory (MBI) using the Cherniss model	Inter-correlation between occupational factor at baseline and burnout at follow-up	Path analysis of effects. Factor at baseline associated with burnout at follow-up. Beta-value
	1 year				Work setting characteristics: 0.51, p<0.001	**Cherniss measures of psychological burnout**
	Schools				Lack of social support: 0.34, p<0.001	Source of stress: Beta = –0.19
Study quality Moderate	2000–2002	n=362	The other factors were assessed with self-questionnaires using questions developed by the authors	All participants completed questionnaires at baseline and at follow-up	Sources of stress: 0.59, p<0.001	**Maslach Burnout Inventory** Source of stress: Beta = –0.13
		178 women and 184 men	All questions are listed in the article			

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Chrisopoulos et al 2010 [122] Australia **Study quality Comments** High *Note*: The article also presents interaction effects between demands and resources	Prospective cohort 1 year Police officers Years of measurement not specified	Participants were a random sample drawn from the Police Association member's database. Age 20–64 years n=179 18 women and 161 men	**Demands** Job demands were assessed with self-questionnaires using the Demand-Induced Strain Questionnaire (DISQ) by Jonge et al	**Emotional exhaustion** Emotional exhaustion was assessed with self-questionn-aires using the emotional exhaustion subscale of the Maslach Burnout Inventory	Correlation between demands at baseline and emotional exhaustion at follow-up (one year later) Cognitive demands: 0.32, p<0.01 Physical demands: 0.28, p<0.01 Emotional demands: 0.36, p<0.01	Lagged structural equation models of emotional exhaustion at follow-up. Unstandardized coefficients (B), standard errors (SE), T-values and standardized co-efficients (beta) are presented **Triple-match and double-match "common kind" interactions** Cognitive demands: 0.10, 0.08, 1.29, 0.007 Physical demands: 0.04, 0.07, 0.59, 0.03 Emotional demands: 0.03, 0.07, 0.41, 0.02 **Non-match or double-match "extended kind" interactions** Cognitive demands: 0.08, 0.08, 0.71, 0.04 Physical demands: 0.04, 0.07, 0.53, 0.03 Emotional demands: 0.05, 0.07, 0.66, 0.04

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
de Lange et al 2004 [75] The Netherlands **Study quality** High	Prospective cohort. Part of the SMASH study 3 years Different professions 1994–1997	Participants were employees working in 34 Dutch companies, working for at least 1 year in current job and at least 20 hours per week. The average age was 36 years. Companies were required not to be involved in any major re-organization during the study period n=668 at the last follow-up (1 694 at baseline) 442 women and 1 252 men at baseline	**Psychosocial work factors** Psychosocial work characteristics were assessed by self-administered questionnaires Job demands and social support were assessed by Karasek's Job Content Questionnaire Job control was defined as the mean of two scales: skill discretion and decision authority	**Emotional exertion** Emotional exertion was assessed by a self-administered questionnaire based on the Maslach Burnout inventory	Correlations between psychosocial work factors at baseline (and at two subsequent measurements) and emotional exertion at the last follow-up **Baseline (3 years prior burnout assessment)** Job demands: 0.29, p<0.05 Control: 0.01, p: ns Social support: −0.12, p<0.05 **2nd measurement (2 years prior burnout assessment)** Job demands: 0.36, p<0.05 Control: −0.05, p<0.05 Social support: −0.21, p<0.05 **3rd measurement (1 year prior burnout assessment)** Job demands: 0.37, p<0.05 Control: −0.11, p<0.05 Social support: −0.25, p<0.05	–

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Demerouti et al 2009 [123] The Netherlands	Prospective cohort 1.5 years (baseline and two follow-ups after 1 and 1.5 years)	Participants were nurses at general hospitals. Mean age: 37 years n=258 196 women and 62 men	**Demands, workload** Job demands were assessed by self-questionnaires using a scale developed by Furda	**Emotional exhaustion, depersonalization** Dimensions of burnout were assessed with self-questionnaires based on a Dutch version of the Maslach Burnout Inventory	Correlation between demands at baseline and burnout after 1 and 1.5 years **Emotional exhaustion** *After 1 year* Physical demands: 0.13, p<0.05 Workload: 0.36, p<0.01 Patient demands: 0.12, p<0.05	Standardized solution (maximum likelihood estimates) of a three-wave model of presenteeism **Emotional exhaustion** *After 1 year* Job demands at baseline: 0.40
Study quality High	Health care Years of measurement not specified		Patient demands were assessed by self-questionnaires using a scale developed by Herschbach Physical demands were assessed by self-questionnaires using questions developed by the authors		*After 1.5 years* Physical demands: 0.15, p <0.05 Workload: 0.32, p<0.01 Patient demands: 0.09, p: ns **Depersonalization** *After 1 year* Physical demands: 0.07, p: ns Workload: 0.26, p<0.01 Patient demands: 0.28, p<0.01 *After 1.5 years* Physical demands: 0.16, p<0.01 Workload: 0.30, p<0.01 Patient demands: 0.25, p<0.01	*After 1.5 years* Job demands after 1 year: 0.16 **Depersonalization** *After 1 year* Job demands at baseline: 0.42 *After 1.5 years* Job demands after 1 year: 0.20

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Geuskens et al 2012 [118] The Netherlands	Prospective cohort Part of the Netherlands working conditions cohort study	Participants were employees aged 15–64 years. Self-employed individuals were excluded. Participants were randomly sampled from the Dutch working population database.	**Physical work-load and several psychosocial factors** Work factors were assessed by self-questionnaires using questions developed by the authors (questions are described in the article)	**Emotional exhaustion** Emotional exhaustion was assessed by self-questionnaire using five questions from the Utrecht Burnout Scale	Influence of work-related characteristics on emotional exhaustion at follow-up in logistic regression analysis. Crude OR (95% CI) **Enterprise restructuring in past 12 months** No: 1.00 Yes, before baseline: 0.99 (0.78; 1.25) Yes, during follow-up: 1.28 (1.02; 1.61) Yes, prolonged: 1.26 (1.04; 1.54)	Influence of work-related characteristics on emotional exhaustion at follow-up in logistic regression analysis. Multivariate OR (95% CI), model adjusting for emotional exhaustion at baseline, enterprise restructuring, demographic factors, job insecurity and other work-related factors **Enterprise restructuring in past 12 months** No: 1.00 Yes, before baseline: 0.86 (0.67; 1.11) Yes, during follow-up: 1.24 (0.98; 1.58) Yes, prolonged: 1.06 (0.86; 1.31)
Study quality Moderate	1 year Dutch working population 2007–2008	Oversampling was made for employees <23 years and for employees with a non-Western background n=9 076 4 629 women and 4 447 men			**Job insecurity** No: 1.00 Yes: 1.52 (1.27; 1.82) **High physical workload** Never: 1.00 Sometimes: 0.95 (0.78; 1.15) Often: 1.22 (1.01; 1.49) **Demands and autonomy** High job demands: 1.82 (1.57; 2.12) Low job autonomy: 1.33 (1.15; 1.54) **Low support** From colleagues: 1.37 (1.18; 1.59) From supervisor: 1.54 (1.33; 1.79)	**Job insecurity** No: 1.00 Yes: 1.46 (1.20; 1.79) **High physical workload** Never: 1.00 Sometimes: p: ns Often: p: ns **Demands and autonomy** High job demands: 1.76 (1.49; 2.07) Low job autonomy: 1.31 (1.11; 1.54) **Low support** From colleagues: 1.31 (1.11; 1.54) From supervisor: 1.35 (1.15; 1.59)

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Hakanen et al 2008 [124] Finland **Study quality** Moderate	Prospective cohort 3 years Dental care No information on which years the measurements were conducted	Participants were members of the Finnish Dental Association Age and gender of the population is described in another article by the same author and not specifically listed in the present study n=2 555	**Psychosocial factors** Job resources and job demands were assessed by the Dentists' Experienced Job Resources Scale by Gorter et al, 2006 Organizational commitment was assessed by two items from the Finnish Healthy organization barometer by Lindström et al, 2000	**Burnout** Burnout was assessed by two scales from the Maslach Burnout Inventory (MBI); emotional exhaustion and depersonalization	Cross-lagged relationships between psychosocial factors at baseline and burnout at follow-up. Correlation Job demands: 0.23, p<0.001 Job resources: −0.05, p<0.05	–

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Janssen et al 2004 [125] The Netherlands **Study quality** Moderate	Prospective cohort 1 year General population working in companies or organizations. Part of the Maastricht Cohort study 1998–1999	Participants included working employees. Persons with long-term physical and psychological illnesses, pregnant women and employees who were sicklisted for more than 1 month were not included n=5 256 Information on gender and age distribution is lacking	**Psychosocial factors** All factors were assessed by self-questionnaires Decision latitude was assessed by an instrument developed by de Jonge Instrument not specified for psychological job demands (five items) or for social support (four items) Work charac-teristics were assessed using the Job Content Questionnaire (JCQ)	**Emotional exhaustion** Emotional exhaustion was assessed by self-questionnaires using a Dutch version of the Maslach Burnout Inventory – General Survey (five items)	**Correlation** Correlation between occupational factors at baseline and emotional exhaustion at follow-up. Pearson correlation coefficient Decision Latitude: −0.14, p <0.01 Job Demands: 0.28, p <0.01 Social Support: −0.19, p <0.01 **Hierarchical regression analysis** Hierarchical regression analyses in four steps, in a population displaying between maximum positive change in decision latitude, job demands and social support respectively, and no change at all, and the dependent variable emotional exhaustion. Exhaustion at follow-up in step 1 corrected for gender, education, age and exhaustion at baseline. Delta R^2 (beta) Decision latitude: 0.51 (−0.01), p<0.001 Job demands: 0.52 (0.03), p<0.001 Social support: 0.54 (−0.01), p<0.001	**Hierarchical regression analysis** Hierarchical regression analyses in four steps, in a population displaying between maximum positive change in decision latitude, job demands and social support respectively, and no change at all, and the dependent variable emotional exhaustion. Exhaustion at follow-up in step 4 corrected for gender, education, age, exhaustion at baseline and a number of psychosocial variables. Delta R^2 (beta) Decision latitude: 0.56 (0.07), p<0.001 Job demands: 0.55 (−0.16), p<0.001 Social support: 0.58 (0.07), p<0.001

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Koponen et al 2010 [126] Finland **Study quality** Moderate	Prospective cohort 2 years Health care sector 2000 and 2002	Participants worked in primary health care, including care for the elderly. Baseline measurements were made 1.8 years after a change in service provider. Participants had at least a 3 month contract of employment, or had worked at least 3 months in the organization. Employees of children's day care and social workers were excluded. Age for participants is presented in 10 year groups, from <34 to >55 years n=369 358 women and 11 men	**Several psychosocial factors** Psychosocial factors were assessed by self-questionnaire using questions developed by the authors (described in the article). Questions on work demands and work control were based on the instrument by Karasek and Theorell. Interactional justice was assessed with instrument developed by Moorman. Work climate was based on the Finnish Institute of Occupational Health Questionnaire	**Emotional exhaustion** Emotional exhaustion was assessed by self-questionnaire based on the Finnish version of the Maslach and Jackson Burnout Inventory	Correlation between psychosocial variables in 2000 and emotional exhaustion in 2002. Pearson correlation coefficient Work insecurity: 0.00 Work demands: 0.61, p<0.01 Work control: −0.45, p<0.01 Interactional justice: −0.30, p<0.01 Work climate: −0.32, p<0.01 Amount and sufficiency of staff: −0.36, p<0.01 Effect of baseline level and changes 2000–2002 on emotional exhaustion in 2002. All factors listed below were positive or did not change Work demands: p<0.001 Work insecurity: p: ns Work control: p<0.001 Interactional justice: p<0.001 Work climate: p<0.001 Sufficiency of staff: p<0.001	Multivariate linear regression model on the effects of a service production model, background variables, baseline level and changes in the psychosocial variables and life situation outside work on emotional exhaustion in 2002. Beta-values **Work demands** In 2000: 0.21, p<0.001 Change: 0.31, p<0.001 **Work control** In 2000: −0.06 Change: −0.06 **Interactional justice** In 2000: 0.02 Change: 0.02 **Work climate** In 2000: −0.06 Change: −0.09 **Perceived sufficiency of staff** In 2000: −0.13, p<0.01 Change: −0.12, p<0.01

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Langballe et al 2011 [133] Norway **Study quality** Moderate	Prospective cohort 2 years Health care 2003 and 2005	Participants were a random sample of physicians drawn from the central Norwegian registers of employment. Mean age was 42 years for women and 48 years for men n=523 291 women and 232 men	**Psychosocial factors** Work hours were self-reported Workload was assessed with self-questionn-aires based on three questions listed in the article Workload and autonomy scales used in the study were based on instruments developed by Aasland et al, Ursin and Cooper et al	**Exhaustion, disengagement** Burnout assessed with self-questionnaires based on a Norwegian version of the 16-item Oldenburg Burnout Inventory (OLBI)	Correlation (Pearson) between work factors at baseline and dimensions of burnout at follow-up **Exhaustion** Work hours per week: 0.12, p<0.01 Workload: 0.38, p<0.01 Autonomy: −0.23, p<0.01 **Disengagement** Work hours per week: 0.10, p<0.05 Workload: 0.26, p<0.01 Autonomy: −0.15, p<0.01	Hierarchical multiple regression analysis. Work factors at baseline, burnout at follow-up. Standardized beta-values **Step 1** *Exhaustion – women* Work hours per week: −0.01, p: ns Workload: 0.02, p: ns Autonomy: 0.07, p: ns *Disengagement – women* Work hours per week: 0.16, p<0.01 Workload: −0.03, p: ns Autonomy: 0.09, p: ns *Exhaustion – men* Work hours per week: 0.03, p: ns Workload:−0.07, p: ns Autonomy: 0.15, p<0.01 *Disengagement – men* Work hours per week: −0.03, p: ns Workload: −0.03, p: ns Autonomy: 0.09, p: ns **Step 2** *Exhaustion – women* Workload: 0.17, p<0.01 Autonomy: −0.07, p: ns *Disengagement – women* Workload: 0.06, p: ns Autonomy: −0.10, p: ns *Exhaustion – men* Workload: 0.31, p<0.001 Autonomy: −0.22, p<0.001 *Disengagement – men* Workload: 0.06, p: ns Autonomy:−0.15, p<0.05

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Le Blanc et al 2007 [127] The Netherlands **Study quality** Moderate	Quasi-experimental (experimental and control groups). The intervention program combined staff support and participatory action Measurements made before the program started, right after the program ended and six months later Oncology care Years of measurement not specified	Participants were staff members at oncology wards. Nine wards were randomly selected to be experimental wards and 20 were controls. Wards were comparable according to structure, composition, staff qualifications and patient populations. Mean age of staff 36.2 years at baseline n=304 at final follow-up 228 women and 76 men at final follow-up	**Several psychosocial factors, workload** All factors were assessed by self-questionnaires Social support from colleagues and supervisors was assessed by instrument by Peters et al Participation in decision making was assessed by instrument by van Veldhoven et al Job control was assessed by instrument by Biesse et al Emotional job demands were assessed by instrument by Herschbach et al	**Emotional exhaustion, depersonalization** Subscales of burnout were assessed with self-questionnaires based on the Maslach Burnout Inventory	Intercorrelation among the burnout variables after six months and the other work factors at baseline **Experimental wards** *Emotional exhaustion* Social support: −0.20 Workload: 0.31 Job control: −0.08 Emotional demands: 0.07 Participating in decision: −0.05 *Depersonalization* Social support: −0.19 Workload: 0.27 Job control: −0.15 Emotional demands: 0.17 Participating in decision: −0.08 **Control wards** *Emotional exhaustion* Social support: −0.12 Workload: 0.30 Job control: −0.03 Emotional demands: 0.24 Participating in decision: −0.17 *Depersonalization* Social support: −0.10 Workload: 0.32 Job control: −0.12 Emotional demands: 0.30 Participating in decision: −0.15	Multilevel model for development over time: time-varying covariates. B (SE), Beta **Emotional exhaustion** Workload: 0.47 (0.04), 0.41, p<0.05 Emotional demands: −0.03 (0.04), −0.02 Job control: −0.08 (0.03), −0.07, p<0.05 Social support: −0.18 (0.04), −0.12, p<0.05 Participating in decision: −0.16 (0.05), −0.09, p<0.05 **Depersonalization** Workload: 0.23 (0.03), 0.28, p<0.05 Emotional demands: −0.06 (0.03), −0.06 Job control: −0.11 (0.03), −0.13, p<0.05 Social support: −0.06 (0.03), −0.06, p<0.05 Participating in decision: −0.00 (0.04) −0.00

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Liljegren et al 2008 [137] Sweden **Study quality** High	Prospective cohort 2 years Governmental agencies Years of measurement not specified	Participants were employees at a governmental agency, including persons on sick-leave and leave of absence. Age 25–65 years (mean 48.7) n=662 at follow-up (792 at baseline) answered the questionnaires At baseline, questionnaires were sent to 602 women and 408 men (n=1 010)	**Justice** The individual experience of justice was assessed by three different self-assessment instruments. Distributive justice was assessed by an instrument by Price, 1986. Procedural justice was assessed by an instrument by Daly, 1995. Interactional justice was assessed by an instrument by Mooreman, 1991	**Burnout** Burnout was assessed with self-questionnaires based on the Copenhagen Burnout Inventory	Correlation (Spearman´s coefficient) between perceived organizational justice at baseline and burnout at follow-up **Personal burnout** Distributive justice: −0.27, p<0.001 Procedural justice: −0.26, p<0.001 Interactional justice: −0.21, p<0.001 **Work related burnout** Distributive justice: −0.32, p<0.001 Procedural justice: −0.30, p<0.001 Interactional justice: −0.28, p<0.001 **Client related burnout** Distributive justice: −0.25, p<0.001 Procedural justice: −0.21, p<0.001 Interactional justice: −0.19, p<0.001	Standardized maximum likelihood estimates and p-values between exogenous variables versus endogenous variables. Justice measured at baseline, burnout measured at follow-up **Personal burnout** Distributive justice: −0.09, p<0.05 Procedural justice: 0.04 Interactional justice: 0.03 **Work related burnout** Distributive justice: −0.09, p<0.05 Procedural justice: 0.05 Interactional justice: −0.03 **Client related burnout** Distributive justice: −0.09, p<0.05 Procedural justice: 0.02 Interactional justice: 0.03

Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Lorente Prieto et al 2008 [130] Spain **Study quality** High	Prospective cohort 8 months Schools Years of measurement not specified	Participants were secondary school teachers from 23 schools in Spain. Mean age was 40 years n=274 156 women and 118 men Participants completed a questionnaire in the beginning and at the end of the academic year (8 months)	**Psychosocial factors** Quantitative overload was assessed with self-questionnaires based on instrument by Beer et al Mental and emotional demands were assessed with self-questionnaires based on instrument by van Veldhoven et al Role ambiguity and conflict were assessed with self-questionnaires based on instrument by Rizzo et al	**Exhaustion, cynicism, depersonalization** Subscales of burnout were assessed with self-questionnaires based on different versions of the Maslach Burnout Inventory (MBI-GS and MBI-HSS)	Significant predictors for burnout at follow-up. Hierarchic regression analyses in five steps for factors at baseline predicting burnout at follow-up. Data listed for the lowest step when the factor was presentment in the analysis. These data are listed: B (Error B), R^2, (delta R^2), Beta **Exhaustion** Quantitative overload (step 2): 0.29 (0.05), – (–), 0.29, $p<0.001$ Role ambiguity (step 2): 0.19 (0.05), 0.30 (0.24), 0.19, $p<0.01$ Emotional demands (step 3): 0.14 (0.06), – (–), 0.14, $p<0.05$ **Cynicism** Role ambiguity (step 2): 0.24 (0.06), – (–), 0.24, $p<0.001$ Role conflict (step 2): 0.15 (0.07), 0.24 (0.19), 0.14, $p<0.05$ Emotional demands (step 4): 0.16 (0.07), – (–), 0.15, $p<0.05$ **Depersonalization** Role conflict (step 2): 0.16 (0.07), 0.11 (0.10), 0.16, $p<0.05$	Significant predictors for burnout at follow-up. Hierarchic regression analyses in five steps for factors at baseline predicting burnout at follow-up. Data listed for the highest step when the factor was presentment in the analysis. These data are listed: B (Error B), R^2, (delta R^2), Beta **Exhaustion** Role ambiguity (step 3): 0.17 (0.06), 0.31 (0.00), 0.17, $p<0.01$ Emotional demands (step 4): 0.16 (0.06), – (–), 0.16, $p<0.05$ Quantitative overload (step 5): 0.12 (0.04), – (–), 0.12, $p<0.05$ **Cynicism** Role ambiguity (step 4): 0.16 (0.07), – (–), 0.16, $p<0.05$ Role conflict (step 5): 0.12 (0.05), – (–), 0.12, $p<0.05$ **Depersonalization** Role conflict (step 4): 0.19 (0.07), – (–), 0.18, $p<0.05$

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Magnusson Hanson et al 2008 [119] Sweden **Study quality** Moderate	Prospective cohort 3 years Working population 2003/ 2004–2006	Participants were derived from the 2003 Swedish Work Environment Survey (SWES). Sample consists of gainfully employed people, sampled through stratification by country, gender, citizenship and employment. Non-employed, persons on sick leave prior to SWES and subjects with baseline physical exhaustion were excluded. Age 16–65 years, most were aged 46–55 years n=3 004 1 493 women and 1 511 men	**Several psychosocial factors** The participants filled out a self-completion questionnaire on physical and psychosocial work environment, work-related morbidity, education and training and the MBI-GS at baseline and follow-up Psychosocial factors were assessed by questions described in the article	**Emotional exhaustion** Emotional exhaustion was assessed with self-questionn-aires based on the Maslach Burnout Inventory (MBI-GS) The subscale Emotional Exhaustion was used	Emotional exhaustion symptoms according to psychosocial work factors. Multivariate analysis adjusted for age, marital status and birth country. OR (95% CI) **Women** High demands: 1.92 (1.48; 2.51) Low decision authority: 1.31 (1.01; 1.71) Downsizing: 1.34 (1.03; 1.74) *Lack of support* From superiors: 1.28 (0.95; 1.72) From fellow workers: 1.80 (1.19; 2.72) *Conflicts* With superiors: 1.18 (0.86; 1.63) With fellow workers: 1.18 (0.88; 1.59) **Men** High demands: 2.23 (1.64; 3.02) Low decision authority: 1.51 (1.11; 2.06) Downsizing: 1.38 (1.02; 1.87) *Lack of support* From superiors: 1.70 (1.22; 2.35) From fellow workers: 1.32 (0.89; 1.96) *Conflicts* With superiors: 1.10 (0.76; 1.59) With fellow workers: 1.41 (0.99; 2.02)	Emotional exhaustion symptoms according to psychosocial work factors. Multivariate analysis adjusted for age, marital status, birth country, social class, sector and physical exhaustion. OR (95% CI) **Women** High demands: 1.79 (1.36; 2.35) Low decision authority: 1.41 (1.07; 1.86) Downsizing: 1.29 (0.99; 1.68) *Lack of support* From superiors: 1.22 (0.91; 1.65) From fellow workers: 1.92 (0.25; 2.93) *Conflicts* With superiors: 1.14 (0.82; 1.59) With fellow workers: 1.15 (0.85; 1.56) **Men** High demands: 2.09 (1.52; 2.88) Low decision authority: 1.36 (0.98; 1.88) Downsizing: 1.39 (1.03; 1.89) *Lack of support* From superiors: 1.65 (1.19; 2.31) Lack of support from fellow workers: 1.45 (0.97; 2.17) *Conflicts* With superiors: 1.12 (0.77; 1.63) With fellow workers: 1.30 (0.90; 1.87)

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Maslach et al 2008 [134] USA **Study quality** Moderate	Prospective cohort 1 year Business and administration 2001–2002	Participants were staff of a business and administrative services division of a university. Age at baseline was 18–60 years or older. Most were 40–59 years n=446 at follow-up (992 at baseline). Calculation of correlations based on 440 persons 186 women, 255 men and 5 unknown gender	**Several psychosocial factors** The Area if Worklife Scale (AWS) was used to assess six areas of worklife The items are worded as statements of perceived congruence or incongruence between oneself and the job Information was collected with self-questionn-aires (surveys) at baseline and at follow-up	**Exhaustion, cynicism, efficacy** Subscales of burnout were assessed with self-questionn-aires based on the Maslach Burnout Inventory (MBI-GS)	Correlation between factors at baseline and subscales of burnout at follow-up one year later **Exhaustion** Workload: −0.43, p<0.01 Control: −0.22, p<0.01 Reward: −0.19, p<0.01 Community: −0.22, p<0.01 Fairness: −0.25, p<0.01 Values: −0.21, p<0.01 **Cynicism** Workload: −0.26, p<0.01 Control: −0.31, p<0.01 Reward: −0.30, p<0.01 Community: −0.24, p<0.01 Fairness: −0.30, p<0.01 Values: −0.28, p<0.01 **Efficacy** Workload: −0.09, p<0.05 Control: 0.06 Reward: −0.09 Community: 0.02 Fairness: 0.06 Values: 0.13, p<0.01	Contrast of baseline (T1) with follow-up (T2). Mean value (SD) **Group that changed towards cynicism only** *Workload* T1: 3.25 (0.75), T2: 2.70 (0.68), p=0.01 *Control* T1: 3.60 (0.89), T2: 3.07 (0.92), p=0.01 *Reward* T1: 3.11 (0.94), T2: 2.83 (0.88) *Fairness* T1: 2.71 (0.76), T2: 2.57 (0.79) *Exhaustion(exh), cynicism (cyn), efficacy (eff)* Exh: T1: 1.23 (0.48), T2: 3.39 (1.24), p=0.01 Cyn: T1: 2.68 (1.03), T2: 3.81 (1.19), p=0.01 Eff: T1: 4.52 (0.98), T2: 4.23 (1.00) **Group that changed towards exhaustion only** *Workload* T1: 2.79 (0.89), T2: 2.61 (0.66) *Control* T1: 3.60 (0.83), T2: 3.13 (1.18) *Reward* T1: 3.58 (0.82), T2: 3.26 (0.62) *Fairness* T1: 2.77 (0.65), T2: 2.32 (0.97), p=0.05 *Exhaustion(exh), cynicism (cyn), efficacy (eff)* Exh: T1: 3.16 (0.96), T2: 3.62 (0.95), p=0.05 Cyn: T1: 0.92 (0.38), T2: 3.30 (1.05), p=0.01 Eff: T1: 4.54 (1.08), T2: 4.38 (1.25)

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Ramarajan et al 2008 [138] USA	Prospective cohort (quasi-experimental) 16 months Health care	Participants were full-time certified nursing assistants working in a long-term health care facility for the elderly	**Organizational respect** Organizational respect was assessed by self-questionnaire based on a scale developed by the authors	**Emotional exhaustion** Emotional exhaustion was assessed with self-questionn-aires based on four items from the emotional exhaustion subscale of the Maslach Burnout Inventory	Correlations among organizational respect at baseline and emotional exhaustion at follow-up (16 months later) Organizational respect: −0.31, p<0.01	Hierarchical regression analysis predicting emotional exhaustion at follow-up from organizational respect at baseline. Values for B (SE B) and beta are listed for the second step of the analysis Organizational respect: −0.20 (0.08), −0.23, p<0.05
Study quality Moderate	2003–2005	At seven experimental units the staff was organized as community teams with different professionals working together to solve problems. In six control units no organizational changes were made during the study period n=106 85 women and 21 men	A higher number reflected higher organizational respect			

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Sundin et al 2011 [120] Sweden **Study quality** Moderate	Prospective cohort 1 year Health care Years of measurement not specified	Participants were registered nurses from three hospitals and two primary health care centres. The average age was 42 years (23–64). Participants with high scores on emotional exhaustion and depersonalization at baseline were excluded n=585 at follow-up (775 at follow-up, before excluding for high scores on burnout at baseline) 731 women and 44 men at follow-up, before excluding for high scores on burnout at baseline	**Several psychosocial factors** All factors were assessed by self-questionn-aires based on questions developed by the authors. Some items were taken from the Swedish Work Environment Survey. All questions are listed in the article	**Emotional exhaustion, depersona-lization** Emotional exhaustion was assessed with self-questionn-aires based on a Swedish version of the emotional exhaustion and Depersonalization subscales of the Maslach Burnout Inventory	Univariate analysis of the association of predictors (occupational factors) to emotional exhaustion and depersonalization at follow-up. OR (95% CI) **Factors at baseline** *Emotional exhaustion* Patient and relative needs: 1.80 (0.97; 3.34) Threats and violence: 1.38 (0.75; 2.54) Quantitative job demands: 1.97 (1.06; 3.63) Supervisor support: 0.95 (0.46; 1.98) Co-worker support: 1.19 (0.63; 2.25) *Depersonalization* Patient and relative needs: 1.80 (0.99; 3.30) Threats and violence: 1.16 (0.63; 2.12) Quantitative job demands: 1.16 (0.63; 2.13) Supervisor support: 2.11 (0.81; 5.45) Co-worker support: 2.09 (1.04; 4.20) **Change in factors, baseline to follow-up** *Emotional exhaustion* Patient and relative needs, unchanged low: 1 Improved: 2.42 (1.08; 5.82) Impaired: 1.75 (0.67; 4.58) Unchanged high: 1.80 (0.84; 3.83) Threats and violence, unchanged low: 1 Improved: 0.51 (0.11; 2.26) Impaired: 2.01 (0.80; 5.09) Unchanged high: 2.10 (1.06; 4.17) Quantitative job demands, unchanged low: 1 Improved: 0.88 (0.28; 2.70) Impaired: 3.05 (1.23; 7.57) Unchanged high: 4.50 (2.17; 9.32) *Results continue on the next page*	Multivariate analyses of the association of predictors (occupational factors) change over time (baseline to follow-up) to emotional exhaustion and depersonalization at follow-up. Adjusted for age, gender, and marital status at baseline and years in profession and years at current workplace at follow-up. OR (95% CI) **Emotional exhaustion** Threats and violence, unchanged low: 1 Improved: 0.41 (0.09; 1.93) Impaired: 1.70 (0.63; 4.59) Unchanged high: 1.30 (0.60; 2.78) Quantitative job demands, unchanged low: 1 Improved: 0.74 (0.23; 2.36) Impaired: 2.88 (1.11; 7.48) Unchanged high: 4.33 (1.98; 9.45) **Depersonalization** Threats and violence, unchanged low: 1 Improved: 0.44 (0.10; 1.99) Impaired: 1.95 (0.80; 4.78) Unchanged high: 1.54 (0.75; 3.15) Co-worker support, unchanged good: 1 Improved: 4.63 (1.14; 18.80) Impaired: 3.58 (0.88; 14.50) Unchanged poor: 5.27 (1.55; 17.94)

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Continued Sundin et al 2011 [120] Sweden					Supervisor support, unchanged good: 1 Improved: – Impaired: 3.45 (0.85; 14.06) Unchanged poor: 2.17 (0.65; 7.26) Co-worker support, unchanged good: 1 Improved: 1.48 (0.44; 5.03) Impaired: 3.10 (1.05; 8.62) Unchanged poor: 2.21 (0.88; 5.56) *Depersonalization* Patient and relative needs, unchanged low: 1 Improved: 1.61 (0.57; 4.54) Impaired: 2.22 (0.88; 5.58) Unchanged high: 2.38 (1.18; 4.81) Threats and violence, unchanged low: 1 Improved: 0.46 (0.10; 2.03) Impaired: 2.53 (1.07; 5.95) Unchanged high: 1.93 (0.97; 3.85) Quantitative job demands, unchanged low: 1 Improved: 1.09 (0.49; 2.42) Impaired: 0.39 (0.09; 1.69) Unchanged high: 0.99 (0.46; 2.13) Supervisor support, unchanged good: 1 Improved: 2.22 (0.39; 12.59) Impaired: 1.73 (0.28; 10.73) Unchanged poor: 2.90 (0.68; 12.35) Co-worker support, unchanged good: 1 Improved: 4.47 (1.12; 17.82) Impaired: 4.43 (1.14; 17.18) Unchanged poor: 4.86 (1.45; 16.27)	

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Sundin et al 2011 [131] Sweden **Study quality Comments** High *Note*: Separate data are also presented for women of foreign background and native Swedish women	Prospective cohort 1 year General population (women) 2002–2003	Participants were women living in Stockholm, randomly selected from the total number of women aged 18–63 years living in Stockholm n=2 300 All participants were women 427 of the participants were of foreign background and 1 873 were native Swedes	**Several psychosocial factors** All factors were assessed by self-questionnaires Job demands, job control and social support at work were assessed with the questionnaire by Karasek et al Weekly working hours were assessed by Swedish classifi-cations systems	**Burnout** Burnout was assessed with self-questionnaires based on the the Shirom-Melamed Burnout Measure by Shirom et al and Melamed et al. It consists of two subscales: emotional/ physical exhaustion and cognitive weariness	Hierarchical multiple linear regression analyses (standardized beta) of association between burnout at follow-up and burnout at baseline and work environment (job demands, job control, social support at work and weekly working hours). Data presented for all participants, regardless of land of birth. Data for block 2 of the model (work environment) is presented **Factor at baseline** Job demands: 0.105, p<0.0001 Job control: −0.016 Social support at work: −0.03 Weekly working hours: 0.028 **Difference in factor (follow-up to baseline)** Job demands: 0.12, p<0.0001 Job control: −0.039 Social support at work: −0.053, p<0.05 Weekly working hours: 0.043	–

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Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Theorell et al 2012 [102] Sweden **Study quality** Moderate	Prospective cohort. Part of the SLOSH cohort 4 years study period, follow-up biannually General population (working) 2006, 2008 and 2010	Participants were gainfully employed people, aged 16–64 years from a Swedish labour force study. Individuals had been sampled in to the study through stratification by country of birth, sex, citizenship and inferred employment status. The stratified sample represented the full population of Sweden n=3 285 Both women and men participated in the study, but the number of men and women is not specified	**Leadership** Dimensions of leadership were assessed by self- questionnaire based on questions described in the article Non-listening leadership – "does your manager listen to you?" Self-centred leadership – "non-partici- pating, "asocial" and "loner"	**Emotional exhaustion** Emotional exhaustion was assessed by self- questionnaire using the three scales in the Maslach Burnout Inventory (MBI)	Leadership variables in 2006 as predictors of emotional exhaustion in 2008. Relative standardized linear beta coefficients (standard errors of mean). Results from multiple linear regressions. Age, gender, income, depressive symptoms in 2006 and emotional exhaustion in 2006 were also included in the equation. Without inclusion of psychological demands and decision latitude at work **Type of leadership** Self-centred: 0.048 (0.070), p=0.473 Non-listening: 0.283 (0.770), p=0.716	Leadership variables in 2006 as predictors of emotional exhaustion in 2008. Relative standardized linear beta coefficients (standard errors of mean). Results from multiple linear regressions. Age, gender, income, depressive symptoms in 2006 and emotional exhaustion in 2006 were also included in the equation. With inclusion of psychological demands and decision latitude at work **Type of leadership** Self-centred: 0.002 (0.060), p=0.961 Non-listening: −0.427 (0.807), p=0.594

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Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
van der Ploeg et al 2003 [128] The Netherlands **Study quality** High	Prospective cohort 1 year Health care, ambulance services Years of measurement not specified	Participants were paramedics and drivers at ambulance services. Ten ambulance services were randomly selected in a group of 80. Mean age 39.8 years n=123 at follow-up (221 at baseline) 32 women and 189 men at baseline	**Several psychosocial factors** Information was collected with self-questionn-aires at baseline and at follow-up Acute stressors were assessed by questions formulated by the researchers Chronic stressors were assessed by the QEAW instrument by van Veldhoven	**Emotional exhaustion, cynicism, personal accomplishment** Burnout was assessed with self-questionnaires using the Dutch version of Maslach Burnout Inventory (MBI)	Pearson correlations between stressors at baseline and psychological symptoms at follow-up **MBI emotional exhaustion** Nr of acute stressful events: 0.30, p<0.01 Poor communication: 0.26, p<0.01 Insufficient financial reward: 0.09, p: ns Lack of job autonomy: 0.25, p<0.01 High emotional demands: 0.27, p<0.01 Physical strains: 0.35, p<0.001 *Lack of social support* From colleagues: 0.29, p<0.01 From supervisor: 0.41, p<0.001 **MBI cynicism** Nr of acute stressful events: 0.20, p<0.05 Poor communication: 0.12, p: ns Insufficient financial reward: −0.05, p: ns Lack of job autonomy: 0.18, p: ns High emotional demands: 0.26, p<0.01 Physical strains: 0.16, p: ns *Lack of social support* From colleagues: 0.27, p<0.01 From supervisor: 0.40, p<0.001 **MBI personal accomplishment** Nr of acute stressful events: −0.18, p: ns Poor communication: −0.09, p: ns Insufficient financial reward: 0.11, p: ns Lack of job autonomy: −0.28, p<0.01 High emotional demands: −0.14, p: ns Physical strains: −0.10, p: ns *Lack of social support* From colleagues: −0.42, p<0.001 From supervisor: −0.34, p<0.001	Results of stepwise multiple regression analyses of health symptoms at follow-up. Data are presented with R^2, Beta, SE, p-value **MBI emotional exhaustion** Poor communication: 0.49, 0.16, 0.003, p<0.05 Physical strains: 0.52, 0.17, 0.005, p<0.05 **MBI cynicism** *Lack of support* From supervisor: 0.16, 0.31, 0.01, p<0.001 **MBI personal accomplishment** *Lack of support* From colleagues: 0.30, −0.23, 0.008, p<0.05 From supervisor: 0.32, −0.20, 0.005, p<0.05

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Table 11.2 continued

Author Year Reference Country	Design Follow-up Setting Performed	Participants Women/men	Occupational factor(-s)	Outcome	Association between occupational factor and burnout; least adjusted model	Association between occupational factor and burnout; most adjusted model
Van de Ven et al 2013 [129] Belgium	Prospective cohort 1 year Technology sector	Participants were employees at a large Belgian organization in the technology sector. The sample included a heterogeneous mix of occupations of information technology professionals, eg welders, electricians and cleaning staff. Mean age 44 years at baseline. The sample consisted of 259 employees with supervisory responsibilities at baseline	**Job demands** Job demands were assessed with self-questionnaires using the DISC questionnaire by de Jonge et al, 2007	**Emotional exhaustion** Emotional exhaustion was assessed with self-questionnaires using five items derived from the Emotional Support-seeking subscale in the Proactive Coping Inventory by Greenglass et al, 1999	Correlation between demands at baseline and emotional exhaustion at follow-up. Pearson intercorrelation **Emotional job demands** 0.29, p<0.01	Hierarchical regression of follow-up emotional exhaustion on baseline emotional job demands. Unstandardized regression weights **Emotional job demands** Step 1: – Step 2: 0.06, p<0.10 Step 3: 0.06, p<0.10 Step 4: 0.10, p<0.05
Study quality Moderate	Years of measurement not specified					
		n=711 39 women and 672 men				

CI = Confidence interval; HR = Hazard ratio; IRR = Incidence rate ratio; OR = Odds ratio;
RR = Relative risk; SE = Standard error; SD = Standard deviation