14 The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. Worldwide variations in the prevalence of asthma symptoms: the International Study of Asthma and Allergies in Childhood (ISAAC). *Eur Respir J* 1998;12:315–335.

15 Amberbir A, Medhin G, Alem A, et al. The role of acetaminophen and geohelminth infection on the incidence of wheeze and eczema: a longitudinal birth-cohort study. *Am J Respir Crit Care Med* 2011;183:165–70.

16 Shaheen SO, Newson RB, Ring SM, et al. Prenatal and infant acetaminophen exposure, antioxidant gene polymorphisms, and childhood asthma. *J Allergy Clin Immunol* 2010;126:1141–8.

17 Barr RG, Wentowski CC, Curhan GC, et al. Prospective study of acetaminophen use and newly diagnosed asthma among women. *Am J Respir Crit Care Med* 2004;169: 836–41.

18 Thomsen SF, Kyvik KO, Skadhauge L, et al. Intake of paracetamol and risk of asthma in adults. *J Asthma* 2008;45:675–6.

19 Beasley R, Clayton T, Crane J, et al. Association between paracetamol use in infancy and childhood, and risk of asthma, rhinoconjunctivitis, and eczema in children aged 6–7 years: analysis from Phase Three of the ISAAC programme. *Lancet* 2008;372: 1039–48.

20 Wang HY, Pizzichini MM, Becker AB, et al. Disparate geographic prevalences of asthma, allergic rhinoconjunctivitis and atopic eczema among adolescents in five Canadian cities. *Pediatr Allergy Immunol* 2010;21:867–77.

21 Lesko SM, Louik C, Vezina RM, Mitchell AA. Asthma morbidity after the short-term use of ibuprofen in children. *Pediatrics* 2002;109:E20.

22 Rebordosa C, Kogevinas M, Sørensen HT, Olsen J. Pre-natal exposure to paracetamol and risk of wheezing and asthma in children: a birth cohort study. *Int J Epidemiol* 2008;37:583–90.

23 Rusconi F, Gagliardi L, Galassi C, et al. Paracetamol and antibiotics in childhood and subsequent development of wheezing/asthma: association or causation? *Int J Epidemiol* 2011;40:662–7.

24 Garcia-Marcos L, González-Díaz C, Garvajal-Urueña I, et al. Early exposure to paracetamol or to antibiotics and eczema at school age: modification by asthma and rhinoconjunctivitis. *Pediatr Allergy Immunol* 2010;21:1036–42.

25 Eneli I, Sadri K, Camargo C Jr, Barr RG. Acetaminophen and the risk of asthma: the epidemiologic and pathophysiologic evidence. *Chest* 2005;12:604–12.

26 Nuttall SL, Khan JN, Thorpe GH, et al. The impact of therapeutic doses of paracetamol on serum total antioxidant capacity. *J Clin Pharm Ther* 2003;28: 289–94.

27 Farquhar H, Stewart A, Mitchell E, et al. The role of paracetamol in the pathogenesis of asthma. *Clin Exp Allergy* 2010;40:32–41.

28 Baudouin SV, Howdle P, O'Grady JG, Webster NR. Acute lung injury in fulminant hepatic failure following paracetamol poisoning. *Thorax* 1995;50:399–402.

29 Koelsch M, Mallak R, Graham GG, et al. Acetaminophen (paracetamol) inhibits myeloperoxidase-catalyzed oxidant production and biological damage at therapeutically achievable concentrations. *Biochem Pharmacol* 2010;79:1156–64.

30 Nassini R, Materazzi S, Andrè E, et al. Acetaminophen, via its reactive metabolite N-acetyl-p-benzo-quinoneimine and transient receptor potential ankyrin-1 stimulation, causes neurogenic inflammation in the airways and other tissues in rodents. *FASEB J* 2010;24:4904–16.

31 de Paramo BJ, Gancedo SQ, Cuevas M, et al. Paracetamol (acetaminophen) hypersensitivity. *Ann Allergy Asthma Immunol* 2000;85:508–11.

32 Carroll KN, Hartert TV. The impact of respiratory viral infection on wheezing illnesses and asthma exacerbations. *Immunol Allergy Clin North Am* 2008;28: 539–61.

33 Singh M. Paracetamol as a risk factor for allergic disorders. *Lancet* 2009;373:119.

34 Tapiainen T, Dunder T, Möttönen M, et al. Adolescents with asthma or atopic eczema have more febrile days in early childhood: a possible explanation for the connection between paracetamol and asthma? *J Allergy Clin Immunol* 2010;125: 751–2.

European Journal of Public Health, Vol. 23, No. 4, 710–716

doi:10.1093/eurpub/cks064 Advance Access published on 8 June 2012

Work–family conflict and health in Swedish working women and men: a 2-year prospective analysis (the SLOSH study)

Constanze Leineweber, Maria Baltzer, Linda L. Magnusson Hanson, Hugo Westerlund

Stress Research Institute, Stockholm University, Stockholm, Sweden

Correspondence: Constanze Leineweber, Stress Research Institute, Stockholm University, SE-106 91 Stockholm, Sweden, Tel: + 46 8 5537 8937, Fax: +46 8 5537 8900, e-mail: constanze.leineweber@stressforskning.su.se

Background: Research has suggested that gender is related to perceptions of work–family conflict (WFC) and an underlying assumption is that interference of paid work with family life will burden women more than men. There is, however, mixed evidence as to whether men and women report different levels of WFC. Even less studies investigate gender differences in health outcomes of WFC. Also the number of longitudinal studies in this field is low. **Methods:** Based on the Swedish Longitudinal Occupational Survey of Health, we prospectively examined the effects of WFC on three different health measures representing a wide spectrum off ill health (i.e. self-rated health, emotional exhaustion and problem drinking). Logistic regression analyses were used to analyse multivariate associations between WFC in 2008 and health 2 years later. **Results:** The results show that WFC was associated with an increased risk of emotional exhaustion among both men and women. Gender differences are suggested as WFC was related to an increased risk for poor self-rated health among women and problem drinking among men. Interaction analyses revealed that the risk of poor self-rated health was substantially more influenced by WFC among women than among men. **Conclusions:** We conclude that, despite the fact that women experience conflict between work and family life slightly more often than men, both men's and women's health is negatively affected by this phenomenon.

Introduction

Labour markets, families and welfare states are changing, as are institutional arrangements and the composition of the workforce. In Sweden, the number of women aged 20–64 years who are in gainful employment ≥20 h/week increased from 52% in 1970 to ~71% in 2005 and is today almost equal to that of men.[1]

Although this development has many advantages, such as the emancipation of women and a better family income, it has also increased the likelihood that workers will be faced with difficulties in organizing work and non-work responsibilities. A concept frequently used to refer to this is 'work–family conflict' (WFC) defined as 'a form of inter-role conflict in which the role pressures from work and family domains are mutually incompatible in some respect'.[2]

Research has suggested that gender is related to perceptions of WFC and an underlying assumption is that interference of paid work with family life will burden women more than men.[3] There is mixed evidence as to whether men and women report different levels of WFC.[4] In an overview report from 2003, it is concluded that 'the empirical evidence [...] shows that no (or hardly any) differences exist between males and females in their experience of negative interaction between work and family',[5] and also Byron's meta-analysis suggests that sex is a poor predictor of WFC.[6] On the other hand, a recent study indicated that the lack of difference in WFC between male and female employees could be an artefact as women had greater difficulties combining work and private life compared with men in equal occupational positions.[7] This assumption gets support from a study of WFC in different social policy contexts, which shows that women in Sweden, a country with many women in higher positions and in full-time employment experienced WFC to a higher degree than women in any other of the five studied countries.[8]

Despite the fact that poor work-life balance has been identified as one of the top emerging psychosocial health risks in the work force,[9] longitudinal studies on health effects of WFC are relatively scarce. Nearly 90% of the work family research is based on cross-sectional studies and only a few have assessed whether WFC *predicts* health outcomes.[10] Even fewer studies investigate gender differences in health outcomes of WFC, and no compelling evidence exists that the strength of the relations of WFC to health outcomes differs between men and women.[11]

The aim of the study is to investigate possible gender differences in experienced WFC and regarding possible health consequences of WFC. We examine the prospective effects of WFC on three different health indicators measured 2 years later.

The three health measures represent a wide spectrum off ill health, which could reflect gender differences in stress response, namely self-rated health, emotional exhaustion and problem drinking. General self-rated health has been shown to be a strong predictor of future morbidity and mortality, functional decline and disability, and utilization of health care[12] and the fact that women report more sub-optimal self-rated health than men has been confirmed in a large number of studies.

Emotional exhaustion is especially common among women and has been found to be related to WFC.[13] Problem drinking can be a maladaptive coping strategy and in Sweden, both the total alcohol consumption and the percentage of heavy episodic drinkers are higher among men than among women.[14]

Methods

Participants

The study population consisted of participants of the Swedish Longitudinal Occupational Survey of Health (SLOSH) study, a nationally representative longitudinal cohort survey focusing on work organisation, work environment and health. SLOSH started in 2006 (Wave 1) with a first follow-up of the Swedish Work Environment Survey (SWES) 2003 ($n = 9214$).[15] A second and third follow-up, including also participants of SWES 2005 ($n = 9703$), were conducted in 2008 ($n = 11\,441$ respondents) and 2010 ($n = 11\,525$ respondents), respectively. SWES consists of a subsample of gainfully employed people aged 16–64 years from the Labour Force Survey. Thus, SLOSH is approximately representative of the Swedish working population in 2003 and 2005. Participants in SLOSH are followed by means of postal self-completion questionnaires, one addressed to 'gainfully employed', i.e. those in gainful employment for at least 30% full time and one to 'not gainfully employed', i.e. those working less or who are outside of the labour force. The present study is based on the 6580 participants (35% of the original sample) who were working at least 30% and who participated in both Waves 2 (2008) and 3 (2010) (Supplementary figure S1).

The analyses were restricted to participants with full information on all included variables and covariates. Thus, 6080 subjects were included in the analyses concerning self-rated health, 5938 in the analyses concerning emotional exhaustion and 5669 in the analyses concerning drinking problems. The study was approved by the Regional Research Ethics Board in Stockholm.

Measures

WFC

In 2008, conflict between work and family life was measured by one question: 'Do the demands placed on you at work interfere with your home and family life?' This question has been used in several other Swedish studies.[16–18] The response options were 'very rarely', 'not very often', 'sometimes', 'very often' and 'the whole time', which were categorised into 'low work–family conflict' ('very rarely' or 'not very often'), 'moderate work–family conflict' ('sometimes') and 'high work–family conflict' ('very often' and 'the whole time').

Self-rated health

General self-rated health, a widely used measure of perceived current health status, which has been shown to predict mortality,[12] was measured by a standard single-item question 'How would you rate your general state of health?' Respondents answered on a 5-point scale dichotomized into good ('very good' and 'good') and sub-optimal ('neither good nor poor', 'poor' and 'very poor').

Emotional exhaustion

Emotional exhaustion was measured by a 5-item subscale from the Maslach Burnout Inventory, General Survey.[19] There were six response options (vs. seven in the original scale) from 'Every day' to 'A few times a year or less/Never'. A collective emotional exhaustion scale score was calculated as the mean of the item scores and individuals were subsequently classified with symptoms of emotional exhaustion (75th percentile or higher) or no symptoms of emotional exhaustion (below the 75th percentile).[20]

Problem drinking

In 2010, problem drinking was measured with the CAGE, which has been found to be an effective screening tool for problem drinking.[21,22] It comprises four yes/no questions about need to cut down on drinking, people criticizing one's drinking, feeling guilty about drinking and need for an eye opener in the morning. Following the standard, two or more positive answers were seen as an indication of problem drinking. As CAGE was not included in the 2008 wave, we used a single question based on AUDIT[23] to control for baseline heavy drinking: 'How often do you drink six such glasses [of alcohol] or more on the same occasion?' A 'glass' is equivalent to:

50 cl medium strength beer or 33 cl strong beer or 1 glass of wine or 1 small glass of fortified wine or 4 cl spirits, e.g. whisky. Response alternatives were 1 = never, 2 = more seldom than once a month, 3 = every month, 4 = every week and 5 = daily or nearly every day.

Covariates

Age, education, marital status, number of children living at home and working hours were included in the analyses as they could be expected to confound relationships between WFC and health.[24] Age, education and marital status were obtained from administrative register data. Education was re-coded into four categories ranging from compulsory school to university education of ≥2 years. In the questionnaires, participants were asked to indicate if they were working full time or part time. Weekly working hours in paid work were assessed by a question regarding how many hours the participant spent on gainful employment/paid work (including overtime at the work place, at home or on business trips).[25] Number of children was measured by means of two questions, 'Do you have any children living at home? Include children living with you at least half of the time' with response alternatives yes/no, and 'If yes: how many?'; here, the participant was asked to give the number of children aged 0–5 years, 6–12 years, 13–19 years and ≥20 years. The total number of children was derived by adding up the numbers given in every category. Since some participants obviously did not enter the number but rather the ages of the child/children living at home in one or more of the fields, and since families with five children or more, especially in a narrow age range, are very rare in Sweden, values above four in a category were set to one. Missing values were set to zero when calculating the number of children living at home. This procedure resulted in 16 persons estimated to have 5 and 1 person to have 6 children living at home, and these were finally included in the 4 or more category used in the analyses.

Statistical analysis

To compare background variables and health between categories of WFC and gender, chi-square and Wilcoxon–Mann–Whitney tests were performed. Tests for normality (Shapiro–Wilk test and a series of goodness-of-fit tests based on the empirical distribution function) were conducted on the original variables. As all outcome variables as well as WFC had skewed distributions, logistic regression analyses were used to analyse multivariate associations. Gender-stratified logistic regression analyses were used to examine the associations between WFC and the three health indicators. Model 0 shows the unadjusted individual effects of WFC. In Model 1, demographic factors (i.e. age, marital status, income and education) were adjusted for. In Model 2, we additionally controlled for workload (i.e. working hours and number of children living at home) and in a last step (Model 3), we additionally controlled for the corresponding health variable at baseline (i.e. self-rated health, emotional exhaustion and heavy drinking). The level of significance was set to 0.001. To study gender differences further, we tested for multiplicative interaction. No adjustment for covariates was applied. All analyses were conducted in SAS, version 9.2.

Results

In total, about 6580 participants were included in the analyses. Gender differences were found regarding WFC, marital status, education, working hours, income and full-time employment (table 1). The prevalence of suboptimal self-rated health was slightly higher among men than among women. However, when compared with men more women reported emotional exhaustion, and twice as many men as women reported problem drinking. Table 2 shows that WFC was significantly associated with age, working hours, income and poor health; it was more common among persons with high education, working full time and those with more children living at home. Restricting the comparison to only participants working full time, the gap between men and women increased. While 8.9% of the men working full-time experienced WFC 'very often' or 'the whole time', the corresponding percentage for women working full time was 12.1% ($P < 0.0001$).

Table 1 Differences in background factors with regard to sex in the SLOSH study, Sweden ($n = 6580$)

Characteristics at baseline		Sex		
		Men ($n = 2889$), Mean (SD)	Women ($n = 3691$), Mean (SD)	P^a
Age 2008	48.6 ± 9.7	48.7 ± 10.0	48.6 ± 9.5	0.573
Weekly working hours	40.5 ± 13.5	43.1 ± 13.1	38.5 ± 13.4	<0.0001
Yearly income (in thousand SEK)	312.4 ± 150.6	359.8 ± 176.7	275.2 ± 112.2	<0.0001
	n (col %)	*n* (row %)	*n* (row %)	P^b
WFC 2008				<0.0001
Very rarely	2467 (37.8)	1133 (39.5)	1334 (36.4)	
Not very often	1234 (18.9)	576 (20.1)	658 (18.0)	
Sometimes	2187 (33.5)	904 (31.5)	1283 (35.0)	
Very often	583 (8.9)	236 (8.2)	347 (9.5)	
The whole time	60 (0.9)	20 (0.7)	40 (1.1)	
Marital status				<0.0001
Unmarried	1896 (28.8)	905 (31.3)	991 (26.8)	
Married	3822 (58.1)	1692 (58.6)	2130 (57.7)	
Divorced	771 (11.7)	272 (9.4)	499 (13.5)	
Widowed	91 (1.4)	20 (0.7)	71 (1.9)	
Education 2008				<0.0001
Compulsory school	590 (9.0)	351 (12.2)	240 (6.5)	
High school	2974 (45.2)	1389 (48.1)	1585 (43.0)	
University (<2 years)	437 (6.6)	268 (9.3)	169 (4.6)	
University (≥2 years)	2576 (39.2)	880 (30.5)	1696 (46.0)	
Children at home 2008				0.202
No	2204 (50.2)	1436 (49.7)	1868 (50.6)	
1 Child	1169 (17.8)	509 (17.6)	660 (17.9)	
2 Children	1584 (24.1)	698 (24.2)	886 (24.0)	
3 Children	428 (6.5)	198 (6.8)	230 (6.2)	
≥ 4 Children	94 (1.4)	48 (1.7)	47 (1.3)	
Full-time employment	5125 (79.4)	2639 (93.4)	2486 (68.5)	<0.0001
Poor self-rated health 2010	1303 (20.1)	600 (21.07)	703 (19.27)	0.019
Emotional exhaustion 2010	1494 (23.3)	522 (18.54)	972 (27.06)	<0.0001
Problem drinking 2010	383 (5.9)	236 (8.28)	147 (4.05)	<0.0001

a: *P*-values from Wilcoxon–Mann–Whitney test.
b: chi-square test.

The associations between WFC and health outcomes are presented for men (table 3) and women (table 4) separately. In the unadjusted models (Model 0), experiencing WFC increased the odds of suboptimal self-rated health 2 years later among both men and women. A comparable result was found regarding emotional exhaustion, however, with much higher Odds Ratios (ORs). Among men, WFC increased the odds of problem drinking. Adjusting for age, education, income and marital status (Model 1) did not alter the results substantially nor did additional adjustment for weekly working hours, and number of children living at home (Model 2). Adjusting for the corresponding health measure at baseline (Model 3) attenuated the ORs of suboptimal self-rated health and emotional exhaustion substantially. However, for women, WFC was still significantly associated with increased odds of suboptimal self-rated health and emotional exhaustion. For men, WFC remained associated with increased odds of emotional exhaustion and problem drinking 2 years later. However, the association between WFC and suboptimal self-rated health became non-significant.

Interaction analyses revealed only one significant interaction, i.e. between WFC and being female with regard to poor self-rated health (OR = 1.39; 95% CI: 1.16–1.67), but not regarding emotional exhaustion (OR = 1.12; 95% CI: 0.93–1.34) and problem drinking (OR = 0.82; 95% CI: 0.60–1.13).

Discussion

In our study, we found a small but significant gender difference in reported WFC, with 10.6% women and 8.9% men reporting WFC 'very often' or 'the whole time'. When restricting the comparison to men and women working full time, we found a larger gap: 3.2 percentage points more women experienced high WFC. Unequally distributed responsibilities for household and childcare are possible explanations.[25,26]

In the present study, WFC predicted suboptimal self-rated health among women. Among men, there was no effect after controlling for self-rated health at baseline. Cross-sectional studies have found WFC to be strongly associated with suboptimal self-rated health, but no gender differences were detected in these studies.[27,28] However, due to the cross-sectional nature, no conclusions can be drawn from these studies regarding the causal nature of the relationship. Our study suggests that WFC can indeed be a contributing factor in the development of suboptimal self-rated health. This does not exclude a reverse effect; poor self-rated health might also increase the risk of experiencing WFC. Such a reverse relationship has indeed been suggested.[29] That longitudinal study, with a 1-year time lag, reported both a significant relationship from time 1 (T1) poor general health to time 2 (T2) WFC as well as from T1 WFC to T2 general health, suggesting a vicious cycle. Furthermore, the study showed that WFC worked as a mediator between T1 job demands and T2 poor self-rated health. In that study, sex was not systematically related to job demands, work–home interference or general health.

A clear association was found between WFC and emotional exhaustion among both men and women, although this association was attenuated when controlling for baseline emotional exhaustion. This is in line with previous research, which has shown a consistent effect of WFC on emotional exhaustion and burnout.[5,30] Research on gender differences, however, is scarce and shows inconsistent results. While some studies found that WFC was more strongly related to women's psychological health and exhaustion than men's,[31] other studies found that WFC was equally harmful to the mental health of both male and female workers.[3] Also Kinnunen and Mauno[32] found a main effect of WFC on job exhaustion, but no interaction with gender. As the above-mentioned studies are cross-sectional, they give no hint regarding the direction of the relationship. Some longitudinal studies of WFC and exhaustion have been reported, but no gender differences regarding the relationship between WFC and exhaustion were discovered.[13,33–35] Last, but not least, we found WFC to be related to problem drinking among men but not among women. In contrast to the outcomes discussed above, the association between WFC and problem drinking was not affected

Table 2 Differences in background factors with regard to work family conflict in the SLOSH study, Sweden ($n = 6580$)

Characteristics at baseline	WFC 2008			
	Low ($n = 3071$), mean (SD)	Moderate ($n = 2187$), mean (SD)	High ($n = 643$), mean (SD)	P[a]
Age 2008	49.3 ± 9.9	47.9 ± 9.5	47.6 ± 9.3	<0.0001
Weekly working hours	38.9 ± 13.4	42.0 ± 13.1	44.8 ± 13.8	<0.0001
Yearly income (in thousand SEK)	300.9 ± 131.4	323.2 ± 169.8	344.5 ± 176.0	<0.0001
	(row %)	*n* (row %)	*n* (row %)	P[b]
Sex				<0.001
Men	1709 (59.6)	904 (31.5)	256 (8.9)	
Women	1992 (54.4)	1283 (35.0)	387 (10.6)	
Marital status				0.578
Unmarried	1076 (16.5)	603 (9.2)	201 (3.1)	
Married	2141 (32.8)	1291 (19.8)	361 (5.5)	
Divorced	430 (6.6)	267 (4.1)	72 (1.1)	
Widowed	54 (0.8)	26 (0.4)	9 (0.1)	
Education 2008				<0.001
Compulsory school	426 (73.4)	117 (20.2)	37 (6.3)	
High school	1808 (61.2)	922 (31.2)	223 (7.6)	
University (<2 years)	236 (54.5)	147 (23.0)	50 (11.6)	
University (≥2 years)	1230 (48.0)	999 (39.0)	333 (13.0)	
Children at home 2008				<0.001
No	2002 (61.3)	997 (30.5)	266 (8.2)	
1 Child	650 (55.8)	399 (34.3)	115 (9.9)	
2 Children	793 (50.2)	588 (37.2)	199 (12.6)	
3 Children	217 (50.8)	162 (37.9)	48 (11.5)	
≥4 Children	39 (41.04)	41 (43.2)	15 (15.8)	
Full-time employment	2848 (55.9)	1717 (33.7)	533 (10.5)	0.018
Poor self-rated health 2010	589 (16.13)	649 (22.44)	218 (34.22)	<0.0001
Emotional exhaustion 2010	503 (13.96)	649 (30.40)	330 (52.72)	<0.0001
Problem drinking 2010	193 (5.30)	144 (6.68)	45 (7.10)	<0.001

a: *P*-values from Wilcoxon–Mann–Whitney test.
b: Chi-square test.

Table 3 Relation between WFC at baseline and ill health at follow-up among men

Baseline WFC	*n*	'Cases'	OR (95%) CI for ill health at follow-up			
			Model 0 Crude	Model 1 Model 0 + age, education, income, marital status	Model 2 M1 + weekly working hours, number of children living at home	Model 3 M2 + corresponding health measure at baseline
General self-rated health						
Low	1590	301	1	1	1	1
Moderate	858	185	1.18 (0.96–1.75)	1.29 (1.05–1.60)	1.39 (1.05–1.60)	1.08 (0.85–1.38)
High	247	80	2.05 (1.53–2.67)	2.34 (1.73–3.17)	2.36 (1.62–3.20)	1.16 (0.80–1.67)
Pseudo R^2			0.008	0.021	0.022	0.183
Hosmer–Lemeshow test			$\chi^2_{(1)} = 0.00$; $P = 1.00$	$\chi^2_{(8)} = 11.28$; $P = 0.186$	$\chi^2_{(8)} = 7.55$; $P = 0.478$	$\chi^2_{(8)} = 4.61$; $P = 0.798$
Emotional exhaustion						
Low	1559	178	1	1	1	1
Moderate	843	197	2.37 (1.89–2.96)	2.46 (1.96–3.08)	2.50 (1.99–3.15)	1.63 (1.26–2.10)
High	243	108	6.21 (4.61–8.36)	6.64 (4.90–9.01)	6.87 (5.03–9.38)	3.03 (2.12–4.34)
Pseudo R^2			0.058	0.065	0.066	0.181
Hosmer–Lemeshow test			$\chi^2_{(1)} = 0.00$; $P = 1.00$	$\chi^2_{(8)} = 7.31$; $P = 0.504$	$\chi^2_{(8)} = 4.75$; $P = 0.784$	$\chi^2_{(8)} = 9.38$; $P = 0.311$
Problem drinking						
Low	1511	109	1	1	1	1
Moderate	819	85	1.49 (1.11–2.00)	1.55 (1.14–2.09)	1.56 (1.15–2.12)	1.68 (1.22–2.32)
High	229	27	1.72 (1.10–2.69)	1.79 (1.14–2.826)	1.81 (1.14–2.88)	1.82 (1.12–2.95)
Pseudo R^2			0.004	0.009	0.010	0.058
Hosmer–Lemeshow test			$\chi^2_{(1)} = 0.00$; $P = 1.00$	$\chi^2_{(8)} = 5.54$; $P = 0.699$	$\chi^2_{(8)} = 6.05$; $P = 0.642$	$\chi^2_{(8)} = 2.21$; $P = 0.974$

Table 4 Relation between WFC at baseline and follow-up ill health among women

Baseline WFC	*n*	'Cases'	OR (95%) CI for ill health at follow-up			
			Model 0 Crude	Model 1 Model 0 + age, education, marital status	Model 2 M1 + weekly working hours, no. of children living at home	Model 3 M2 + corresponding health measure at baseline
General self-rated health						
Low	1826	249	1	1	1	1
Moderate	1192	269	1.85 (1.53–2.23)	1.96 (1.61–2.38)	2.01 (1.65–2.44)	1.61 (1.30–1.99)
High	367	132	3.56 (2.77–4.58)	3.97 (3.07–5.15)	4.20 (3.23–5.46)	2.63 (1.95–3.54)
Pseudo R^2			0.030	0.039	0.042	0.168
Hosmer–Lemeshow test			$\chi^2_{(1)} = 0.00$; $P = 1.00$	$\chi^2_{(8)} = 7.17$; $P = 0.518$	$\chi^2_{(8)} = 6.05$; $P = 0.642$	$\chi^2_{(8)} = 6.27$; $P = 0.616$
Emotional exhaustion						
Low	1780	286	1	1	1	1
Moderate	1161	403	2.78 (2.33–3.31)	2.82 (2.36–3.36)	2.886 (2.39–3.42)	1.55 (1.26–1.90)
High	352	208	7.54 (5.89–9.66)	8.08 (6.26–10.42)	8.33 (6.44–10.77)	2.70 (2.01–3.62)
Pseudo R^2			0.090	0.100	0.100	0.229
Hosmer–Lemeshow test			$X^2_{(1)} = 0.00$; $P = 1.00$	$\chi^2_{(8)} = 13.09$; $P = 0.109$	$\chi^2_{(8)} = 6.82$; $P = 0.556$	$\chi^2_{(8)} = 17.48$; $P = 0.026$
Problem drinking						
Low	1683	70	1	1	1	1
Moderate	1090	56	1.25 (0.87–1.79)	1.18 (0.82–1.70)	1.16 (0.81–1.68)	1.17 (0.81–1.70)
High	337	16	1.15 (0.66–2.00)	1.069 (0.60–1.86)	1.03 (0.58–1.81)	1.12 (0.63–2.00)
Pseudo R^2			0.000	0.004	0.004	0.018
Hosmer–Lemeshow test			$\chi^2_{(1)} = 0.00$; $P = 1.00$	$\chi^2_{(8)} = 10.45$; $P = 0.235$	$\chi^2_{(8)} = 8.10$; $P = 0.423$	$\chi^2_{(8)} = 13.68$; $P = 0.090$

by controlling for baseline heavy drinking, which might be explained by the fact that we used another measure at baseline which may capture high alcohol consumption rather than alcohol problems *per se*. To our knowledge, rather few studies have studied the effect of WFC on alcohol use and heavy drinking, most of which are cross-sectional. In line with our findings, 15 years ago, Frone *et al.*[24] found, based on a large community sample of employed parents, significant associations from WFC to depression, poor physical health and heavy alcohol use; and a stronger relationship between WFC and heavy alcohol consumption was found among men than among women. Also other studies suggest that WFC is associated with heavy drinking.[3,24,36–38] In contrast to our findings, however, two recent studies focusing on gender differences report associations between WFC and heavy drinking among women (but not among men)[39] and between WFC and problem drinking among both men and women, with a stronger association among women.[40] In marked contrast to the latter studies, we found an effect of WFC on problem drinking among men, but not among women. In general, problem drinking might be lower in Sweden than in other countries.[14] In our study, 8% of the men and 4% of the women reported problem drinking. In comparison, Finnish data indicate problem drinking (also measured in means by CAGE) to be 39% among men and 17% among women.[40] Another possible explanation for the low numbers is that the shame and double standards in relation to alcohol that are prevalent in the Swedish population prevent people, and especially women, from reporting problem drinking. Underreporting of problem drinking could, however, be a possible explanation for the lack of association between WFC and problem drinking among women. One longitudinal study suggests that reverse causality is unlikely to explain the reported associations.[38]

A major strength of our study is that it comprises an approximately representative sample of the Swedish working population representing a wide range of occupations and the different outcomes studied represent overall health as well as psychological ill health and health behaviours. Analyses were restricted to participants with full information on the respective outcomes and covariates, which reduced the study sample substantially. Sensitivity analyses revealed that more women than men, older participants and persons with fewer children failed to answer to a relevant question. Regarding the outcome self-rated health, we could see that participants with low or medium WFC in 2008 more often failed to answer relevant questions. So also did widowed persons with regard to the outcomes of emotional exhaustion and drinking problems. Another limitation is the use of self-reports, it has, for example, been shown that social desirability and the order and wording of items influence how those are answered. Health problems, especially drinking problems, but also WFC are likely to be underreported. Actually, the small amounts of alcohol consumption reported in SLOSH 2008 made us suspect a substantial under-reporting of alcohol use and made the use of cut-offs impossible. Consequently, we changed the measure of alcohol to CAGE in 2010. Also an underestimation of WFC among participants without family is possible owing how the question regarding WFC was formulated. Restricting the analyses to participants with children only, however, did not substantially change the results, except that men with children and WFC had no increased risk for heavy drinking. Another limitation is that although predictors and outcomes were collected at different points in time, no firm conclusions about causality can be drawn. Health selection could, furthermore, have introduced a bias in the results, if women with health problems, possibly partially caused by WFC, were more prone to leave the labour market than men suffering the same consequences, leaving only the hardier in work. Indeed, the higher rates of sickness absence and disability pension among women than men indicate that this could be the case. However, although this could bias the relative strength of the associations for women and men, it is unlikely that it would influence the differences in patterns of associations between the men and women.

Conclusion

Despite the fact that the estimated strength of the associations between WFC and all health outcomes varied between men and women, a significant interaction with gender was revealed only regarding self-rated health, indicating a substantially higher risk for poor self-rated health for women with WFC.

The present study suggests that WFC is slightly more common among women and that this conflict affects both men's and women's health. Future studies are needed to deepen the understanding of WFC and ill health using longitudinal data with measurements of all variables from at least three occasions to better gauge causal associations.

Supplementary Data

Supplementary Data are available at *Eurpub* online.

Acknowledgements

Special thanks to Dr Holendro Singh Chungkham for his statistical advice. We also want to thank all participants of SLOSH.

Funding

This study was supported by the Swedish Council of Working life and Social Research (FAS, grant #2005-0734, grant #2008-0958 and grant #2009-1077) and the Swedish Research Council (VR, grant #2009-6192). This work was carried out within the framework of Stockholm Stress Center (FAS #2009-1758), a FAS Centre of Excellence.

Conflicts of interest: None declared.

Key points

- Imbalance between work and private life has been described as one of the major psychosocial risks today.
- There is mixed evidence as to whether men and women report different levels of WFC and no compelling evidence exists that the strength of the associations between WFC and health outcomes differ between men and women.
- We found that slightly more women reported WFC, especially among full-time workers.
- WFC increases the risk for emotional exhaustion among men and women, poor self-rated health among women and heavy drinking among men.
- WFC could be an important risk factor for problem drinking among men, and thus a possible target for intervention.

References

1 Angelov N, Johannson P, Lindahl E, et al. *Kvinnors och mäns sjukfrånvaro [Women and Mens Sickness Absence]*. Uppsala: Institutet för arbetsmarknadspolitisk utvärdering [The Institute of Labour Market Policy Evaluation], 2011.

2 Greenhouse JH, Beutell NJ. Sources of conflict between work and family roles. *Acad Manage Rev* 1985;10:76–88.

3 Frone MR. Work-family conflict and employee psychiatric disorders: the National Comorbidity Survey. *J Appl Psychol* 2000;85:888–95.

4 Eby LT, Casper WJ, Lockwood A, et al. Work and family research in IO/OB: content analysis and review of the literature (1980–2002). *J Vocat Behav* 2005;66:124–97.

5 Geurts SAE, Demerouti E. Work/Non-work interference: a review of theories and findings. In: Schabracq M, Winnubst JAM, Cooper CL, editors. *The Handbook of Work and Health Psychology*. Chichester: J. Wiley & Sons, Ltd., 2003:279–312.

6 Byron K. A meta-analytic review of work-family conflict and its antecedents. *J Vocat Behav* 2005;67:169–98.

7 Hämming O, Bauer G. Work-life imbalance and mental health among male and female employees in Switzerland. *Int J Public Health* 2009;54:88–95.

8 Strandh M, Nordenmark M. The interference of paid work with household demands in different social policy contexts: perceived work-household conflict in Sweden, the UK, the Netherlands, Hungary, and the Czech Republic. *Br J Sociol* 2006;57:597–617.

9 Brun E, Milczarek M, Roskams N, et al. *Expert Forecast on Emerging Psychosocial Risks Related to Occupational Saftey and Health*. Luxembourg: Office for Official Publications of the European Communities, 2007.

10 Casper WJ, Eby LT, Bordeaux C, et al. A review of research methods in IO/OB work-family research. *J Appl Psychol* 2007;92:28–3.

11 Frone MR. Work-family balance. In: Quick JC, Tetrck LE, editors. *Handbook of Occupational Health Psychology*. Washington, DC: American Psychological Association, 2003:143–62.

12 Bailis DS, Segall A, Chipperfield JG. Two views of self-rated general health status. *Soc Sci Med* 2003;56:203–17.

13 van Hooff ML, Geurts SA, Taris TW, et al. Disentangling the causal relationships between work-home interference and employee health. *Scand J Work Environ Health* 2005;31:15–29.

14 *European Status Report on Alcohol and Health 2010*. Geneva: World Health Organization, 2010.

15 Magnusson Hanson LL, Theorell T, Oxenstierna G, et al. Demand, control and social climate as predictors of emotional exhaustion symptoms in working Swedish men and women. *Scand J Public Health* 2008;36:737–43.

16 Nylen L, Melin B, Laflamme L. Interference between work and outside-work demands relative to health: unwinding possibilities among full-time and part-time employees. *Int J Behav Med* 2007;14:229–36.

17 Alfredsson L, Hammar N, Fransson E, et al. Job strain and major risk factors for coronary heart disease among employed males and females in a Swedish study on work, lipids and fibrinogen. *Scand J Work Environ Health* 2002;28:238–48.

18 Voss M, Josephson M, Stark S, et al. The influence of household work and of having children on sickness absence among publicly employed women in Sweden. *Scand J Public Health* 2008;36:564–72.

19 Maslach C, Jackson SE, Leiter MP. *Maslach Burnout Inventory*, 3rd edn. Palo Alto: Consulting Psychologists Press, Inc, 1996.

20 Brenninkmeijer V, VanYperen N. How to conduct research on burnout: advantages and disadvantages of a unidimensional approach in burnout research. *Occup Environ Med* 2003;60(Suppl 1):i16–20.

21 Mayfield D, McLeod G, Hall P. The CAGE questionnaire: validation of a new alcoholism screening instrument. *Am J Psychiatry* 1974;131:1121–3.

22 Ewing JA. Detecting alcoholism. The CAGE questionnaire. *JAMA* 1984;252:1905–7.

23 Babor TF, Higgins-Biddle JC, Saunders JB, et al. *AUDIT. The Alcohol Use Disorders Identification Test. Guidelines for Use in Primary Care*, 2nd edn. Geneva: World Health Organization, 2001.

24 Frone MR, Russell M, Barnes GM. Work-family conflict, gender, and health-related outcomes: a study of employed parents in two community samples. *J Occup Health Psychol* 1996;1:57–69.

25 Lundberg U, Mårdberg B, Frankenhaeuser M. The total workload of male and female white collar workers as related to age, occupational level, and number of children. *Scand J Psychol* 1994;35:315–27.

26 Berntsson L, Lundberg U, Krantz G. Gender differences in work-home interplay and symptom perception among Swedish white-collar employees. *J Epidemiol Commun H* 2006;60:1070–6.

27 Emslie C, Hunt K, Macintyre S. Gender, work-home conflict, and morbidity amongst white-collar bank employees in the United Kingdom. *Int J Behav Med* 2004;11:127–34.

28 Winter T, Roos E, Rahkonen O, et al. Work-family conflicts and self-rated health among middle-aged municipal employees in Finland. *Int J Behav Med* 2006;13: 276–85.

29 van der Heijden BI, Demerouti E, Bakker AB. Work-home interference among nurses: reciprocal relationships with job demands and health. *J Adv Nurs* 2008;62: 572–84.

30 Amstad FT, Meier LL, Fasel U, et al. A meta-analysis of work-family conflict and various outcomes with a special emphasis on cross-domain versus matching-domain relations. *J Occup Health Psychol* 2011;16:151–69.

31 Canivet C, Ostergren PO, Lindeberg SI, et al. Conflict between the work and family domains and exhaustion among vocationally active men and women. *Soc Sci Med* 2010;70:1237–45.

32 Kinnunen U, Mauno S. Antecedents and outcomes of work-family conflict among employed women and men in Finland. *Hum Relat* 1998;51:157–77.

33 Leiter MP, Durup MJ. Work, home and in-between: a longitudinal study of spillover. *J Appl Behav Sci* 1996;32:29–47.

34 Demerouti E, Bakker AB, Bulters AJ. The loss spiral of work pressure, work-home interference and exhaustion: reciprocal relations in a three-wave study. *J Vocat Behav* 2004;64:131–49.

35 Rantanen J, Kinnunen U, Feldt T, et al. Work-family conflict and psychological well-being: stability and cross-lagged relations within one- and six-year follow-ups. *J Vocat Behav* 2008;73:37–51.

36 Frone MR, Russell M, Cooper ML. Relationship of work family conflict, gender, and alcohol expectancies to alcohol-use abuse. *J Organ Behav* 1993;14:545–58.

37 Frone MR, Barnes GM, Farrell MP. Relationship of work-family conflict to substance use among employed mothers the role of negative affect. *J Marriage Fam* 1994;56:1019–30.

38 Frone MR, Russell M, Cooper ML. Relation of work-family conflict to health outcomes: a four-year longitudinal study of employed parents. *J Occup Organ Psych* 1997;70:325–35.

39 Lallukka T, Chandola T, Roos E, et al. Work-family conflicts and health behaviors among British, Finnish, and Japanese employees. *Int J Behav Med* 2010;17: 134–42.

40 Roos E, Lahelma E, Rahkonen O. Work-family conflicts and drinking behaviours among employed women and men. *Drug Alcohol Depen* 2006;83:49–56.