Original article

Scand J Work Environ Health 2008;34(2):96–106

Risk factors for interpersonal conflicts at work

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De Raeve L, Jansen NWH, van den Brandt PA, Vasse RM, Kant I. Risk factors for interpersonal conflicts at work. *Scand J Work Environ Health.* 2008;34(2):96–106.

Objectives The main goal of this study was to identify work-related risk factors for the onset of interpersonal conflicts at work.

Methods Longitudinal data from the Maastricht Cohort Study on "fatigue at work" (N=9241) were used. After the respondents who reported an interpersonal conflict at baseline were excluded, logistic regression analyses were used to determine the role of several work-related risk factors at baseline in the onset of a conflict with coworkers or supervisors after 1 year of follow-up.

Results Higher psychological job demands, higher levels of role ambiguity, the presence of physical demands, higher musculoskeletal demands, a poorer physical work environment, shift work, overtime, and higher levels of job insecurity significantly predicted the onset of both a coworker conflict and a supervisor conflict. Higher levels of coworker and supervisor social support, more autonomy concerning the terms of employment, good overall job satisfaction, monetary gratification, and esteem reward significantly protected against the onset of both a coworker conflict and a supervisor conflict. Higher levels of decision latitude and more career opportunities also significantly protected against the onset of a supervisor conflict.

Conclusions Several factors in the work environment were related to the onset of interpersonal conflicts at work. Given the rather serious consequences of interpersonal conflicts at work with respect to health and well-being, the observed risk factors can serve as a starting point for effective prevention and intervention strategies in the workplace.

Key terms coworker conflict; job content; longitudinal study; Netherlands; supervisor conflict; terms of employment; work relations; work conditions.

Interpersonal conflicts have often been identified as a leading source of stress in occupational settings (1–3). On the basis of a review of the literature, Barki & Hartwick (4) defined interpersonal conflict as "a dynamic process that occurs between interdependent parties as they experience negative emotional reactions to perceived disagreements and interference with the attainment of their goals [p 234]". In our study, interpersonal conflicts were limited to conflicts experienced at work (ie, conflicts with coworkers or supervisors). Interpersonal conflicts at work have a negative impact on the job satisfaction and well-being of employees (5, 6) and have previously been shown to be associated with work disability (7) and with several mental health outcomes, like psychiatric morbidity (8), depression (9), and fatigue and psychological distress (10). In light of the rather serious consequences of interpersonal conflicts with respect to health and well being, conflict mediation is more and more becoming a hot topic for managers and employers (11, 12). It is, however, not always clear what groups or situations need to be targeted in the prevention and management of conflicts. For example, do conflicts occur more often among shift workers than among day workers? Or do they mainly occur in a work situation in which job demands are high? A previous cross-sectional study using the Finnish twin cohort (13) found that monotonous work and hectically paced work, white-collar status, hostility, and neuroticism were significantly associated with interpersonal conflicts. So far, evidence from cross-sectional studies describing high-risk groups for interpersonal conflicts at work is scarce. In addition, to our knowledge, longitudinal evidence identifying

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important work-related risk factors for the development of interpersonal conflicts with coworkers and supervisors is almost nonexistent. Nevertheless, both cross-sectional and longitudinal insight into the etiology of interpersonal conflicts is important and may serve as a starting point when effective prevention and intervention strategies are designed for the workplace.

Our study focuses on work-related risk factors for interpersonal conflicts with supervisors or coworkers. Various factors in the work environment may play a role in the onset of interpersonal conflicts at work. The pressure to produce more and to work faster with fewer resources may result in irritability, frustration, and anger. This may especially be the case when the demands of the job interfere with demands at home. For example, shift work or regular overtime may not always be compatible with being a parent, with running a household, or with participating in leisure-time activities. Employees may then become irritated or fatigued, which may influence relationships at work. Moreover, if there are perceived disagreements about tasks, if there are ambiguities in role definitions, or if the responsibilities are unclear, the stage is set for interpersonal friction between the persons involved. Perceived inequities between a person's own work situation and that of fellow workers may also result in conflicting situations. For example, employees may become irritated because their colleagues have better work conditions, do not have to work as hard, get more respect, or earn more money. A conflict may also arise when employees perceive an imbalance between their own career aspirations and the career opportunities within the company, or when there is strong competition to get a particular job.

Risk factors contributing to the onset of interpersonal conflicts at work may thus originate from different domains of the work situation, such as the content of the job, work conditions, work relations, the conditions of employment, and the employees' evaluation of their work. As so far little is actually known about the etiology of interpersonal conflicts at work, we tentatively hypothesized that poor work relations (ie, low levels of social support) and job content that is characterized by high psychological job demands, low decision latitude, or high role ambiguity constitute a higher risk of developing interpersonal conflicts at work. Moreover, we hypothesized that a highly demanding work environment (eg, high physical demands or poor physical work environment) constitutes a higher risk for the onset of interpersonal conflicts. We also expected that certain conditions of employment such as shift work and overtime, but also few career opportunities, imply an elevated risk of developing interpersonal conflicts at work. Finally, we hypothesized that poor overall job satisfaction or high effort–reward imbalance increases the risk of developing interpersonal conflict.

The purpose of this study was not to provide clear insight into the pathways through which work-related factors may contribute to the onset of interpersonal conflict at work, but rather to explore a broad range of work-related factors that may contribute to the onset of a conflict at work. As such, this study may contribute to future theorizing and research on interpersonal conflicts at work.

Although previous research on this issue is rather scarce, it is important to keep in mind some considerations stemming from prior research on the outcomes of interpersonal conflicts. First, the impact of work-related interpersonal conflicts may depend on the source of the conflict. Previous research has found differential outcomes for conflicts with coworkers and conflicts with supervisors (5, 14). Therefore, we studied the risk factors for conflicts with coworkers and supervisors separately. Second, the relationship between interpersonal conflicts and social support has not been thoroughly examined in previous research. Does the existence of interpersonal conflict necessarily imply a lack of social support? Or are they unrelated concepts? A previous study (15) found that conflicts with coworkers and conflicts with supervisors were significantly associated with depersonalization and emotional exhaustion, respectively, while neither coworker nor supervisor social support was significantly associated with any of the dimensions of burnout. Finally, when the relationship between work-related factors and the onset of interpersonal conflicts at work are examined, the influence of possible confounding factors, such as demographic factors or living situation, should be taken into account, as they may be related to characteristics of the work situation, as well as to the onset of interpersonal conflict.

The first goal of our study was to gain insight into the prevalence and incidence of interpersonal conflicts and to describe the overlap between interpersonal conflicts with and social support from coworkers and supervisors. Our second and main goal was to use longitudinal data to examine the role of several work-related factors at baseline as risk factors for the development of interpersonal conflicts with coworkers or supervisors after 1 year of follow-up.

Study population and methods

Study population

This study was based on data from the Maastricht Cohort Study, a prospective study on fatigue at work (16), in which employees from 45 different companies (both blue-collar and white-collar jobs) were followed by means of self-administered questionnaires, which they received at 4-month intervals. Once a year, in May, the employees received an extensive questionnaire with

items on work- and nonwork-related factors, demographics, and health factors. Twice a year (in September and January) they received a short questionnaire that mainly captured health outcome measures. In May 1998, the baseline questionnaire was sent to 26 978 employees. A total of 12 161 employees completed and returned the baseline questionnaire (response rate of 45%). Altogether 21 respondents were excluded from the analysis for technical reasons. The baseline (T_0) cohort thus consisted of 12 140 people and captured both blue-collar and white-collar workers. Nonresponse analyses at baseline yielded no significant differences between the respondents and nonrespondents regarding demographic characteristics such as age, gender, and education (17). Further details on nonresponse, the procedure, and the sectors and trades represented in the Maastricht Cohort Study have been reported elsewhere (16, 18). Employees who had completed the baseline questionnaire and at least one of the following two short questionnaires (T_1 and T_2) received the 1-year follow-up questionnaire (T_3) in May of 1999 (response rate 79.5%, N=9655). Nonresponse analyses at the 1-year follow-up revealed that the nonrespondents were likely to report more interpersonal conflicts with coworkers at baseline than the respondents (8.6% versus 7.1%, χ^2=6.07, P<0.05). Moreover, the nonrespondents at the 1-year follow-up were likely to report more interpersonal conflicts with supervisors at baseline than the respondents (12.2% versus 9.7%, χ^2=11.99, P<0.01). Only the employees who completed the T_0 and T_3 questionnaires were included in this study (N=9655). Moreover, the employees with multiple jobs at baseline (N=414) were excluded because information about the content and the characteristics of the other jobs was lacking. This selection resulted in a final study population of 9241 employees, consisting of 73.1% men and 26.9% women. Descriptive characteristics of the study population at baseline are presented in table 1 separately for conflicts with coworkers and supervisors.

Interpersonal conflicts

Two items from the Dutch questionnaire on the experience and evaluation of work (Dutch abbreviation: VBBA) (19) were used to measure conflicts with coworkers and supervisors. Conflicts with coworkers were assessed with the question "Do you have conflicts with your coworkers? (no, yes)". Conflicts with supervisors were assessed with the question "Do you have conflicts with your daily supervisor? (no, yes)".

Work-related risk factors

Several possible work-related risk factors for interpersonal conflicts with coworkers or supervisors were assessed at baseline (T_0). The work-related factors were divided into the following five domains: (i) job content, (ii) work conditions, (iii) work relations, (iv) terms of employment, and (v) the evaluation of work.

Job content

Psychological job demands and decision latitude were measured at baseline with a validated Dutch version of the job content questionnaire (20, 21). Psychological job demands were assessed by the sum of five items (Cronbach's α=0.70). Decision latitude (Cronbach's α=0.80) consisted of the following two subscales: skill discretion (six items on the amount of skill used in the job) and decision authority (three items on the opportunity to make decisions concerning the job). For each item, the response options were as follows: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree. For each scale, the total score was calculated by summing the response scores of the items. Higher scores indicated more psychological job demands and more decision latitude. Role ambiguity was measured by two items from the Dutch questionnaire on the experience and evaluation of work (19): "Is it clear to you what you are responsible for in your work? (no, yes)" and "Has it been clearly specified what your tasks are at work? (no, yes)". The scores of the items were summed to generate a total score ranging from 0 to 2 (Cronbach's α=0.72). Higher scores indicated more role ambiguity or, in other words, less role clarity.

Work conditions

Physical demands were assessed with a one-item question, which was derived from the Dutch questionnaire on work and health (22): "Would you consider your work to be physically demanding? (no, yes)". Musculoskeletal demands were measured using the sum of one item (physically demanding work) from the Dutch questionnaire on work and health (22) and four items (work that often requires the same posture over a long period, difficult postures, repeated movements often over a long period, and carrying or lifting heavy weights) from a questionnaire on musculoskeletal load and health complaints, which had previously been validated for Dutch employees (23, 24). The response option for each item was "no" or "yes". The five items were summed to generate a total score, ranging from 0 to 5 (Cronbach's α=0.67), with higher scores indicating higher musculoskeletal demands. The physical work environment was measured using four items from the Dutch questionnaire on work and health (22) on whether employees were bothered with heat or cold, lack of fresh air, noise and a nasty smell (no, yes). A sum score was generated (Cronbach's α=0.70) with higher scores indicating a poorer physical work environment.

Table 1. Baseline descriptive characteristics of the study population according to conflict with coworkers and supervisors. Significance levels apply to the difference from no coworker conflict or no supervisor conflict, respectively. The significance levels for the continuous variables have been determined with independent-sample t-tests, and those for the categorical variables have been determined with chi-square tests.

Characteristic	Baseline coworker conflict						Baseline supervisor conflict					
	No (N=8505)			Yes (N=651)			No (N=8230)			Yes (N=885)		
	Mean	SD	% [a]	Mean	SD	% [a]	Mean	SD	% [a]	Mean	SD	% [a]
Age	41.54	8.77	·	40.72 [b]	8.49	·	41.46	8.79	·	41.57 [c]	8.47	·
Gender (percentage of men)	·	·	72.7	·	·	78.2 [d]	·	·	72.3	·	·	79.8 [e]
Education												
Low	·	·	19.0	·	·	23.0 [d]	·	·	18.5	·	·	25.6 [e]
Medium	·	·	45.0	·	·	46.4	·	·	45.1	·	·	46.2
High	·	·	35.9	·	·	30.7	·	·	36.4	·	·	28.2
Living alone (percentage of yes responses)	·	·	9.2	·	·	14.4 [e]	·	·	9.6	·	·	9.7 [c]
Long-term illness (percentage of yes responses)	·	·	23.7	·	·	28.2 [b]	·	·	23.0	·	·	32.5 [e]
Job content												
Psychological job demands (scale range 12–48)	33.10	5.59	·	35.15 [e]	6.12		32.93	5.51	·	35.99 [e]	6.16	·
Decision latitude (scale range 24–96)	72.16	11.13	·	69.50 [e]	11.90		72.48	10.96	·	67.36 [e]	12.16	·
Role ambiguity (scale range 0–2)	0.40	0.70	·	0.65 [e]	0.83		0.38	0.69	·	0.71 [e]	0.86	·
Work conditions												
Physical demands (percentage of yes responses)	·	·	23.5	·	·	32.7 [e]	·	·	22.8	·	·	36.1 [e]
Musculoskeletal demands (scale range 0–5)	1.57	1.46	·	1.98 [e]	1.61		1.54	1.44	·	2.07 [e]	1.64	·
Poor physical work environment (scale range 0–4)	1.18	1.30	·	1.71 [e]	1.41		1.15	1.27	·	1.85 [e]	1.46	·
Work relations												
Coworker social support (scale range 4–16)	11.97	1.52	·	10.51 [e]	1.94		11.92	1.57	·	11.46 [e]	1.79	·
Supervisor social support (scale range 4–16)	10.50	2.29	·	9.44 [e]	2.49		10.72	2.12	·	7.82 [e]	2.40	·
Terms of employment												
Work schedule (percentage of shift work)	·	·	27.2	·	·	38.1 [e]	·	·	26.4	·	·	42.2 [e]
Overtime (percentage of yes responses)	·	·	45.3	·	·	51.3 [d]	·	·	45.3	·	·	50.0 [d]
Supervisory function (percentage of yes responses)	·	·	24.4		·	27.2 [c]			24.5		·	25.3 [c]
Autonomy (scale range 0–6)	4.29	1.80	·	3.86 [e]	1.92		4.34	1.76	·	3.56 [e]	2.00	·
Career opportunities (scale range 0–3)	1.87	1.14	·	1.49 [e]	1.16		1.91	1.13	·	1.22 [e]	1.09	·
Job insecurity (scale range 0–2)	0.23	0.55	·	0.45 [e]	0.73		0.22	0.54	·	0.48 [e]	0.74	·
Evaluation of work												
Overall job satisfaction (scale range 0–3)	2.42	0.72	·	1.97 [e]	0.87		2.45	0.70	·	1.82 [e]	0.86	·
Monetary gratification (percentage of yes responses)	·	·	51.8	·	·	39.55 [e]	·	·	52.7	·	·	36.1 [e]
Esteem reward (percentage of yes responses)	·	·	53.0	·	·	27.3 [e]	·	·	55.2	·	·	16.2 [e]

[a] Percentage of the total.
[b] P<0.05.
[c] Not significant.
[d] P<0.01.
[e] P<0.001.

Work relations

Social support from coworkers and supervisors was measured at baseline with a validated Dutch version of the job content questionnaire (20, 21). Social support was measured with the following two scales, each consisting of four items: coworker support (eg, "My colleagues take an interest in me"; "My colleagues are

friendly"; Cronbach's α=0.76) and supervisor support (eg, "My supervisor is concerned with his or her employees"; "My supervisor is helpful in getting the job done"; Cronbach's α=0.85). For each item, the response options were as follows: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. For each scale the total score was calculated by summing the response scores of the items. Higher scores indicated more social support from either coworkers or supervisors.

Terms of employment

Work schedule captured day work versus shift work. In this study, day work comprised normal workhours between 0700 and 1900. Shift work captured three-shift, four-shift, five-shift, and irregular shift work, all including frequent night work (18). Overtime was assessed by asking employees whether they frequently worked overtime (no, yes). It was also determined whether the participants occupied a supervisory function (no, yes). Autonomy with respect to the terms of employment was measured by six items on autonomy with respect to workpace, workhours, holidays, leaving the workplace, and taking breaks from the Dutch monitor on stress and physical load (25). The items were summed to generate a total score ranging from 0 to 6 (Cronbach's α=0.78), higher scores indicating more autonomy concerning the terms of employment. Career opportunities were measured by two items from the Dutch questionnaire on the experience and evaluation of work (19) (possibilities to take extra courses or training, possibilities for personal growth and development) and one item (sufficiency of career opportunities) from a survey on living conditions in the Netherlands (26). The items were summed to generate a total score ranging from 0 to 3 (Cronbach's α=0.72), higher scores indicating more career opportunities. Job insecurity was measured by one item from the Dutch questionnaire on the experience and evaluation of work (19) ("Do you fear losing your job on short notice?"), and one item from the questionnaire on work and health (22) ("Does this work environment offer you enough security?"). The items were summed to generate a total score ranging from 0 to 2 (Cronbach's α=0.67), higher scores indicating more job insecurity.

Evaluation of work

Overall job satisfaction was measured with one item on how employees would describe their overall job satisfaction. The response options were as follows: 1 = good, 2 = reasonable, 3 = moderate, 4 = not good. The response options were recoded to a scale ranging from 0 to 3, higher scores indicating more job satisfaction. The employees' evaluation of the balance between their efforts and rewards was assessed with two items derived from a validated Dutch version of the effort–reward imbalance questionnaire (27, 28). These items assessed monetary gratification ("Do you think that, considering all your efforts and achievements, your salary is adequate?") and esteem reward ("Do you think that, considering all your efforts and achievements, you receive the respect you deserve at work?"). The response options were "no", "yes", and "I don't know". The last option was recoded as "missing".

Possible confounding factors

In the analyses, we corrected for age, educational level, living situation, and the presence of a long-term illness, as these variables might be related to both the work situation and the onset of an interpersonal conflict. Moreover, we examined interactions between every work-related factor and gender. However, as none of these interactions were significant, the analyses in this study were not stratified for gender. Gender was then included as a possible confounder in the analyses. Information on age, gender, educational level, living situation ("Do you live alone?" no, yes) and the presence of a long-term illness ("Do you have a long-term illness?" no, yes) was obtained through self-report in the baseline (T_0) questionnaire.

Statistical analysis

Chi-square tests (for categorical variables) and independent sample t-tests (for continuous variables) were conducted to examine whether the employees who did and did not experience a conflict differed significantly with respect to several personal characteristics and work-related factors.

Multivariate logistic regression analyses were conducted to examine the role of several work-related factors at baseline in the onset of a conflict with coworkers or supervisors after 1 year of follow-up. Logistic regression analyses were first conducted for each work-related factor separately. The onset of a conflict was estimated between the baseline and the 1-year follow-up. Therefore, when the incidence of coworker conflict was examined, all of the employees reporting a conflict with coworkers at baseline were excluded. When the incidence of supervisor conflict was examined, all of the employees reporting a conflict with their supervisor at baseline were excluded. As such, odds ratios (OR) and 95% confidence intervals (95% CI) were calculated separately for coworker conflict and supervisor conflict. All of the regression analyses were corrected for gender, age, education, living situation, and the presence of a long-term illness.

Subsequently, the work-related risk factors in the domains of job content, work conditions, work relations,

and the terms of employment that showed a significant effect on the onset of an interpersonal conflict in the previous regression analyses were entered into a multivariate model so that we could examine the simultaneous effect of these baseline risk factors on the onset of interpersonal conflicts at work after 1 year of follow-up. These domains were chosen as they contain modifiable factors that can be subject to change if necessary or requested. Separate analyses were conducted for coworker and supervisor conflict and corrected for gender, age, education, living situation, and the presence of a long-term illness. All of the analyses in this study were performed using SPSS 13.0 statistical packages (29).

Results

Prevalence of conflicts at baseline and the incidence after 1 year of follow-up

The baseline prevalence of interpersonal conflicts in this study was 7.11% (N=651) for coworker conflict and 9.71% (N=885) for supervisor conflict. In this study, the phi (Φ) correlation coefficient (ie, a Pearson correlation between two dichotomous variables) for coworker and supervisor conflict was 0.244 (P<0.001). A minority (2.5%) of the total study population reported a conflict with both coworkers and their supervisor at baseline. About 7.2% reported a conflict with their supervisor but not with coworkers, and 4.6% had a conflict with coworkers but not with their supervisor. The remaining 85.7% reported no conflicts at baseline. When conflicts at baseline were excluded, the incidence of coworker conflict after 1 year of follow-up (T_3) was 3.9% (N=325). The incidence of supervisor conflict after 1 year of follow-up (T_3) was 5.3% (N=429).

Baseline descriptive characteristics of the study population

Table 1 shows the descriptive characteristics of the study population at baseline. The table shows that conflicts with coworkers and with supervisors relatively more often occurred among the men, the employees with a low level of education, and the persons with a long-term illness. Moreover, coworker conflict relatively more often occurred among the employees who lived alone. Furthermore, the employees who experienced a conflict with their coworkers were, on the average, somewhat younger than those who did not experience a coworker conflict.

With regard to job content, the employees experiencing interpersonal conflicts at work reported significantly higher levels of psychological job demands, lower levels of decision latitude, and more role ambiguity. With respect to the work conditions, the employees with interpersonal conflicts at work reported significantly more physical demands, higher levels of musculoskeletal demands, and a poorer physical work environment. This was the case for both coworker and supervisor conflicts. Regarding work relations, table 1 shows that the employees reporting interpersonal conflict with either coworkers or their supervisor reported significantly lower levels of social support from both their coworkers and their supervisor. As regards the terms of employment, it appears from table 1 that both conflicts with coworkers and supervisors occurred significantly more often among the shift workers and employees working overtime. Furthermore, the respondents with an interpersonal conflict reported lower levels of autonomy with respect to their work conditions, fewer career opportunities, and more job insecurity. Concerning the evaluation of their work, the employees reporting a conflict with either a coworker or a supervisor reported worse overall job satisfaction, and they less often considered their efforts and achievements at work to be in balance with their income and the respect they received at work.

Overlap between interpersonal conflicts and social support

The Pearson correlation coefficient for coworker conflict and coworker social support (continuous) was –0.234 (P<0.01). The Pearson correlation coefficient for supervisor conflict and supervisor social support (continuous) was –0.371 (P<0.01). To examine the overlap between interpersonal conflicts and social support in more detail, we dichotomized the total scores for social support at the median, scores above the median indicating high coworker or supervisor social support. Among the employees reporting a conflict with their coworkers, 65.8% also reported low coworker social support. Nevertheless, 34.2% reported high coworker social support. Among the employees with a conflict with their supervisor, 86.4% reported low support from their supervisor, while only 13.6% reported high social support from their supervisor.

Risk factors for interpersonal conflicts with coworkers and supervisors

The prospective relationships between several work-related factors at baseline and the onset of a conflict with either a coworker or a supervisor after 1 year of follow-up are shown in table 2. Odds ratios were calculated for each risk factor separately and were controlled for gender, age, education, living situation, and the presence of a long-term illness. Higher psychological job demands, higher levels of role ambiguity, the presence

Table 2. Work-related risk factors at baseline as risk factors for interpersonal conflicts with coworkers and supervisors after 1 year of follow-up. The odds ratios (OR) for the continuous independent variables refer to a 1-point increase in the total scale. (95% CI = 95% confidence interval)

Risk factors	Coworker conflict		Supervisor conflict	
	OR [a]	95%CI	OR [a]	95%CI
Job content				
Psychological job demands (scale range 12–48)	1.04 [b]	1.02–1.06	1.05 [b]	1.04–1.07
Decision latitude (scale range 24–96)	1.00 [c]	0.99–1.01	0.98 [b]	0.97–0.99
Role ambiguity (scale range 0–2)	1.41 [b]	1.21–1.64	1.60 [b]	1.40–1.82
Work conditions				
Physical demands				
No	1.00 (ref)	..	1.00 (ref)	..
Yes	1.53 [d]	1.16–2.01	1.69 [b]	1.33–2.16
Musculoskeletal demands (scale range 0–5)	1.16 [d]	1.07–1.26	1.14 [b]	1.06–1.23
Poor physical work environment (scale range 0–4)	1.26 [b]	1.15–1.38	1.27 [b]	1.17–1.37
Work relations				
Coworker social support (scale range 4–16)	0.84 [b]	0.78–0.91	0.88 [b]	0.82–0.93
Supervisor social support (scale range 4–16)	0.93 [d]	0.89–0.98	0.80 [b]	0.77–0.84
Terms of employment				
Work schedule				
Day work	1.00 (ref)	..	1.00 (ref)	..
Shift work	1.41 [e]	1.02–1.95	1.79 [b]	1.35–2.37
Overtime				
No	1.00 (ref)	..	1.00 (ref)	..
Yes	1.29 [e]	1.02–1.64	1.35 [d]	1.10–1.67
Supervisory function				
No	1.00 (ref)	..	1.00 (ref)	..
Yes	1.21 [c]	0.92–1.59	1.18 [c]	0.93–1.49
Autonomy (scale range 0–6)	0.93 [e]	0.87–0.99	0.84 [b]	0.80–0.89
Career opportunities (scale range 0–3)	0.91 [c]	0.82–1.00	0.70 [b]	0.64–0.76
Job insecurity (scale range 0–2)	1.23 [e]	1.02–1.49	1.62 [b]	1.40–1.88
Evaluation of work				
Overall job satisfaction (scale range 0–3)	0.74 [b]	0.64–0.85	0.57 [b]	0.50–0.64
Monetary gratification				
No	1.00 (ref)	..	1.00 (ref)	..
Yes	0.72 [e]	0.56–0.92	0.62 [b]	0.49–0.77
Esteem reward				
No	1.00 (ref)	..	1.00 (ref)	..
Yes	0.60 [b]	0.46–0.77	0.36 [b]	0.29–0.46

[a] The odds ratios were corrected for gender, age, education, living alone, and the presence of a long-term illness.
[b] P<0.001.
[c] Not significant.
[d] P<0.01.
[e] P<0.05.

of physical demands, higher musculoskeletal demands, a poorer physical work environment, shift work, overtime, and higher levels of job insecurity significantly predicted the onset of both a coworker and a supervisor conflict. Higher levels of social support from coworkers and supervisors, more autonomy concerning the terms of employment, good overall job satisfaction, monetary gratification, and esteem reward significantly protected against the onset of both a coworker and a supervisor conflict. In addition, higher levels of decision latitude and more career opportunities also significantly protected against the onset of a supervisor conflict.

Multivariate model of risk factors for interpersonal conflicts

All work-related factors in the domains of job content, work conditions, work relations, and the terms of employment that significantly predicted the onset of interpersonal conflict in the previous regression analyses were entered simultaneously into a multivariate model using a logistic regression analysis in order to examine the simultaneous effect of these baseline risk factors on the incidence of interpersonal conflicts at work after 1 year of follow-up, while correcting for gender, age, education, living situation, and the presence of a long-term illness. The multivariate model revealed that higher levels of role ambiguity and a poor physical work environment significantly predicted the onset of a coworker conflict (table 3). Higher levels of coworker social support significantly protected against the onset of a coworker conflict. Furthermore, higher levels of role ambiguity and overtime significantly predicted the onset of a supervisor conflict after 1 year of follow-up in the multivariate model. Higher levels of social support from supervisors and more career opportunities significantly protected against the onset of a supervisor conflict. Although not statistically significant, shift work and higher levels of job insecurity also seemed to increase the odds for the onset of a supervisor conflict.

Discussion

The objectives of our study were to gain insight into the prevalence and incidence of interpersonal conflicts at work and to examine the role of several work-related risk factors at baseline as risk factors for the development of interpersonal conflicts with coworkers or supervisors after 1 year of follow-up. In our study, the prevalence of interpersonal conflict at baseline was 7.1% for coworker conflict and 9.7% for supervisor conflict. For the participants who reported no conflicts at baseline, the incidence of interpersonal conflict after

1 year of follow-up was 3.9% for coworker conflict and 5.3% for supervisor conflict. Regarding the baseline characteristics of the study population, differences between the employees who did and did not experience a conflict were statistically significant in most cases. This finding may partly be due to the high number of respondents in this study. Some rather large differences could be observed for some groups, such as respondents with a long-term illness and employees working in shifts or working overtime. Furthermore, this study showed prospective relationships between several work-related risk factors and conflicts with coworkers or supervisors over time. It showed that various factors in the work environment, such as job content, work conditions, work relations, terms of employment, and employees' evaluations of work may play a role in the onset of interpersonal conflicts at work. Overall, our tentative hypotheses were confirmed.

The results of our study also showed that conflicts with supervisors seem to occur more often than conflicts with coworkers. Moreover, the rather low correlation between the conflict variables in this study seems to indicate different concepts of conflict. In addition, odds ratios for the onset of a supervisor conflict seemed larger than those for the onset of a coworker conflict. It is possible that workers feel that their supervisor is responsible for issues that arise in the workplace. When a supervisor is called to account for the problems an employee encounters, a conflict may result. The results of our study suggest that, for future research on interpersonal conflicts at work, it is important to differentiate between coworker and supervisor conflict, as risk factors for interpersonal conflicts at work may vary according to the source of the conflict (ie, conflict with coworkers or supervisors). In our study, gender was not a moderator of the relationship between work-related factors and interpersonal conflicts. This finding suggests that the risk factors for interpersonal conflicts at work were not statistically different between the men and women. Furthermore, we adjusted the results for gender, age, education, living situation, and the presence of a long-term illness. Compared with the results of a crude model, the odds ratios decreased somewhat, but they remained in the expected direction and stayed statistically significant in most cases.

When significant risk factors for interpersonal conflicts were combined in an overall multivariate model, the results showed that higher levels of role ambiguity and a poor physical work environment significantly predict the onset of a coworker conflict, while higher levels of coworker social support significantly protect against the onset of a coworker conflict. Conflict with a supervisor was predicted by higher levels of role ambiguity and by overtime, while higher levels of social support from supervisors and more career opportunities significantly protected against the onset of a conflict with a supervisor. Compared with the earlier analyses of our study, in the overall multivariate model, the odds ratios decreased and often became nonsignificant. This finding may be explained by the fact that the predictors were often highly correlated. This high correlation may have some implications for the prevention of interpersonal conflicts at work. Preventive efforts aimed at one particular risk factor may also influence other risk

Table 3. Multivariate model of work-related risk factors at baseline for interpersonal conflicts with coworkers and supervisors after 1 year of follow-up. The odds ratios (OR) for the continuous independent variables refer to a 1-point increase in the total scale. (95% CI = 95% confidence interval)

Risk factors	Coworker conflict		Supervisor conflict	
	OR [a]	95%CI	OR [a]	95%CI
Job content				
Psychological job demands (scale range 12–48)	1.02 [b]	0.99–1.04	1.02 [b]	1.00–1.04
Decision latitude (scale range 24–96)	. [c]	.	1.00 [b]	0.99–1.01
Role ambiguity (scale range 0–2)	1.26 [d]	1.06–1.51	1.39 [e]	1.19–1.62
Work conditions				
Physical demands				
No	1.00 (ref)	..	1.00 (ref)	..
Yes	1.12 [b]	0.71–1.75	1.22 [b]	0.81–1.82
Musculoskeletal demands (scale range 0–5)	1.05 [b]	0.92–1.21	0.96 [b]	0.85–1.09
Poor physical work environment (scale range 0–4)	1.16 [f]	1.03–1.30	1.10 [b]	0.99–1.22
Work relations				
Coworker social support (scale range 4–16)	0.87 [d]	0.80–0.95	0.94 [b]	0.87–1.01
Supervisor social support (scale range 4–16)	0.99 [b]	0.93–1.05	0.87 [e]	0.83–0.93
Terms of employment				
Work schedule				
Day work	1.00 (ref)	..	1.00 (ref)	..
Shift work	1.25 [b]	0.84–1.87	1.37 [b]	0.96–1.96
Overtime				
No	1.00 (ref)	..	1.00 (ref)	..
Yes	1.23 [b]	0.92–1.63	1.35 [f]	1.04–1.75
Autonomy (scale range 0–6)	1.02 [b]	0.93–1.12	0.95 [b]	0.88–1.04
Career opportunities (scale range 0–3)	. [c]	.	0.87 [f]	0.77–0.98
Job insecurity (scale range 0–2)	0.99 [b]	0.79–1.25	1.20 [b]	0.99–1.44

[a] The odds ratios were corrected for gender, age, education, living alone, and the presence of a long-term illness.
[b] Not significant.
[c] This factor was not added to the multivariate model as it did not have a significant impact in the previous regression analyses.
[d] P<0.01.
[e] P<0.001.
[f] P<0.05.

factors, either positively or negatively. Ideally, effective preventive measures aim at highly prevalent risk factors with a high impact. Moreover, from a practical point of view, it is useful to take modifiable factors as a starting point for developing preventive measures. Results from this study indicate that attempts can be made to decrease role ambiguity, to enhance the physical work environment, and to increase social support in order to reduce the possibility for developing interpersonal conflicts. Moreover, improving the factors within the domain of the terms of employment, such as reducing the amount of overtime or improving workers' career opportunities, may prevent the onset of a conflict with a supervisor.

The results of our study showed that employees are able to experience both interpersonal conflicts and high social support simultaneously. However, social support and interpersonal conflicts with coworkers were only modestly related in this study, while the overlap with social support was somewhat larger for supervisor conflict. This finding may be explained by the source of the conflict (coworker or supervisor conflict). For example, one particular coworker may cause a conflict, while most coworkers may provide social support. This situation is, however, more unusual when it applies to conflicts with and support from a supervisor and may therefore explain why the amount of overlap is somewhat larger for conflicts with and support from a supervisor. For future research, it may be useful to examine whether employees who experience both high social support and interpersonal conflicts are able to benefit from social support as it is undermined by interpersonal conflicts. In other words, do the negative effects of interpersonal conflicts outweigh the positive effects of high social support (30)?

Although this study showed that many factors were statistically significantly related to the onset of conflicts at work, in general, the observed effects were rather small. Therefore, clinical relevance may be questioned. Some of the methodological features of our study may have had an impact on the strength of the effects found. First, where possible, the continuous scores of the scales for the independent variables were used. As such, even a small change (eg, a 1-point increase in the psychological job demands scale with a range from 12 to 48) significantly predicted the onset of a conflict. Increasing the contrast in the independent variables by using, for example, the upper tertile to define a contrast between employees with and without high demands resulted in a larger effect and higher odds ratios for the onset of a conflict in our study. In addition, the risk factors in our study were highly prevalent. Consequently, even though risk factors may show a rather small effect in terms of odds ratios, the effect may be clinically relevant, because the risk factors are highly prevalent. Second, it is possible that the time frame used in our study was not adequate to detect the largest effect. We used work-related risk factors at baseline to predict the onset of an interpersonal conflict after 1 year of follow-up. It is, however, possible that the work environment changed within that year. Moreover, our first measurement was not a true baseline measurement as the employees were already in the middle of an ongoing process, both with regard to the work-related factors as with respect to the course of the conflict. It is possible that a conflict was recurring or was already latent at our baseline measurement due to previous levels of, for example, high job demands. Moreover, despite frequent sampling (every 4 months) in the large-scale Maastricht Cohort Study, we were not able to study the incidence of interpersonal conflicts within these short periods of time, as conflicts were only assessed in the extensive questionnaires that were sent out annually. Therefore, we do not exactly know when a conflict developed or how long the conflict situation lasted. It is possible that a conflict resulting from high job demands was already resolved at the 1-year follow-up or that the conflict we observed after 1 year was already the second or third conflict. In future research, it might be interesting to use shorter time lags to measure the incidence of conflicts.

The following issues should be kept in mind when our results are interpreted. First, although we found several work-related factors to be risk factors in the onset of interpersonal conflicts at work, it is also possible that these factors were outcomes rather than risk factors. For example, poor overall job satisfaction may not only have been a risk factor for the development of conflict, but it may also have been the result of an interpersonal conflict. In future studies, it is important to keep in mind a possible reciprocal relationship between work-related factors and interpersonal conflicts. Second, in our study, the influence of negative affectivity in the relationship between work-related risk factors and the onset of interpersonal conflicts was examined, but, as in most cases, it did not influence this relationship. It was left out of the analyses. Not including negative affectivity as a confounder is consistent with the approach of Spector and his colleagues (31), who stated that negative affectivity should not be considered a bias in need of statistical control. Third, both coworker and supervisor conflict were measured with one item asking employees whether they had conflicts with their coworkers or their supervisor. Especially when the construct being measured is multidimensional, single item measures may raise concern with respect to the validity of the study. A previous study (32), however, obtained very high correlations between individuals' global assessments of interpersonal conflicts and a multidimensional measure of interpersonal conflicts based on assessments of disagreement, interference, and negative emotion. Although our study did not provide an in-depth look

at the underpinnings of the construct of interpersonal conflicts, and future research might benefit from using a multi-item scale for measuring interpersonal conflicts at work, we do think that our overall assessment of interpersonal conflicts is useful and valuable. In fact, our measures did not only show the expected relationships with several work-related factors in a large study population, they also differentiated between coworker and supervisor conflict, which was an important shortcoming of previous studies. Fourth, the baseline prevalence data may have been somewhat biased because of the initial response rate of 45%. Moreover, it is possible that the prevalence and incidence of supervisor conflict were somewhat underestimated, as the item on supervisor conflict referred to conflict with the daily supervisor, and potential conflict with other or higher managers was not included in this item. Fifth, all work-related factors, as well as the presence of interpersonal conflict, were measured by means of questionnaire data. The findings could thus have reflected common method variance, which may lead to an overestimation of the strength of the association between the work-related risk factors and the incidence of interpersonal conflict. In future research, it might be interesting to include some objective measures of the work environment as well. Finally, although we corrected for possible confounding factors in our study, the potential existence of unidentified confounding factors cannot be ruled out.

Although these limitations should be kept in mind when the results of our study are interpreted, several strengths of our study should be mentioned as well. The results of our study were based on data from a large-scale, prospective cohort study that enabled us to study the prospective relationship between a broad range of work-related factors and the onset of interpersonal conflicts over a 1-year follow-up period. Our study showed that various factors in the work environment play a role in the onset of interpersonal conflicts at work and may contribute to future theorizing and research on the antecedents of interpersonal conflicts at work. Moreover, given the rather serious consequences of interpersonal conflicts at work with respect to health and well being, the results of this study may serve as a starting point when effective prevention and intervention strategies are designed for the workplace.

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Received for publication: 21 September 2007