

Problematic Interpersonal Relationships at Work and Depression: A Swedish Prospective Cohort Study

Ulrich STOETZER¹, Gunnel AHLBERG², Gun JOHANSSON³, Peter BERGMAN¹, Lennart HALLSTEN⁴, Yvonne FORSELL⁵ and Ingvar LUNDBERG⁶

¹Department of Public Health Sciences, Occupational and Environmental Medicine, Karolinska Institutet, ²School of Sustainable Development of Society and Technology, Mälardalen University, ³Department of Medical and Health Sciences, Linköping University, ⁴Department of Clinical Neuroscience, Karolinska Institutet, ⁵Department of Public Health Sciences, Karolinska Institutet and ⁶Department of Medical Sciences, Uppsala University, Sweden

Abstract: Problematic Interpersonal Relationships at Work and Depression: A Swedish Prospective Cohort Study: Ulrich STOETZER, et al. Department of Public Health Sciences, Occupational and Environmental Medicine, Karolinska Institutet, Sweden—Objectives: Studies have shown that interpersonal relations at work are important for several health related outcomes. The aim of the present study was to investigate whether low social support, serious conflict, exclusion by superiors or by co-workers at work may be determinants of depression. **Methods:** In a representative Swedish cohort study data were obtained in two waves three years apart. 4,040 women and men who did not change their jobs between the waves were chosen for the study. Exposure and confounders were obtained at Time 1 and outcome, depression according to Bech's MDI at Time 2. Previous depression was controlled for by adjusting for depression at Time 1. Data were analyzed using multiple logistic regression analyses. **Results:** Odds-ratios adjusted for possible confounders and depression at base-line showed significant effects for all four exposures on depression (adjusted OR, low social support 1.5 CI 95% 1.1–2.0, serious conflict 1.4 CI 95% 1.1–1.9, exclusion by superiors 1.6 CI 95% 1.2–2.1 and exclusion by co-workers 1.7 CI 95% 1.2–2.3). **Conclusions:** The present results support the conclusion that problematic interpersonal relationships at work can be determinants of depression. These prospective findings may be of relevance for prevention and when rehabilitating depressed patients. (*J Occup Health 2009; 51: 144–151*)

Key words: Depression, Interpersonal relationships, Work

Depression is one of the leading causes of disability in the world today. According to the WHO, unipolar depressive disorders are among the top ten causes of life years lost due to premature mortality and disability (Disability-Adjusted-Life-Years, DALYs)¹. The Swedish National Board of Health and Welfare² has estimated the prevalence of depressive and anxiety symptoms in need of treatment to be between 12 and 18%. Since most people suffering from depression never seek medical care and obtain a diagnosis, population-based studies are important to determine the causes and consequences of depression³.

It has been suggested that an important cause of depression might be detrimental psychosocial working conditions. Among such conditions, high demands and high strain, a combination of high demands and low decision latitude are often studied^{4–8}. Two reviews have been published recently. Both conclude that there is clear evidence for associations between high demands and low social support and depression^{9, 10}. Social support is a dimension of psychosocial working conditions that comprises interpersonal relationships at work. Some researchers propose that, for example, social support at work can be subsumed under a broader concept of interpersonal relationships or social climate at work^{11, 12}. Four exposure variables in this study, social support, conflicts, exclusion by superiors and exclusion by co-workers, were chosen in an attempt to capture different aspects of interpersonal relationships at work. Among these, social support is probably the best known and most studied^{13–15}.

Social support is often divided into emotional support, like being given praise and instrumental support, like

Received Sep 25, 2008; Accepted Jan 8, 2009

Published online in J-STAGE Feb 18, 2009

Correspondence to: U. Stoetzer, Department of Public Health Sciences, Occupational and Environmental Medicine, Karolinska Institutet, 171 76 Stockholm, Sweden (e-mail: ulrich.stoetzer@ki.se)

being given the resources needed to do one's work¹⁶). A number of studies have found associations between low social support, both emotional and instrumental, and psychological distress and/or depression^{6, 8–10, 12, 15–22}).

Whether conflicts at work are associated with depression has rarely been studied. Conflicts at work have most often been studied within the framework of conflict management and its effect on productivity. Conflicts at work are sometimes included in instrument-like indices used to measure detrimental working conditions^{13, 23}). A number of researchers have suggested that conflicts at work will affect mental well-being. There is a need for more studies addressing the consequences of conflicts at work^{24–28}).

Exclusion by superiors or by co-workers differs from conflicts in that conflicts involve two or more persons who interact in a hostile way¹²), whereas exclusion at work is a one-way, prolonged oppression of a person and can therefore be regarded as a dimension of harassment or bullying at work, which has only recently been the subject of epidemiological studies. These studies have found associations between bullying and psychological distress and depression^{29–31}).

Based on classical research by Brown and Harris³²), the likelihood of developing depression increases when negative life events and difficulties involve entrapment i.e. impaired possibilities to counter adverse conditions, and humiliation i.e. the risk of losing pride in front of others. Problematic interpersonal relationships at work could constitute such events and difficulties.

Due to limited current knowledge there are reasons for more studies on problematic interpersonal relationships at work and on their association with depression.

The aim of this study was to investigate in a prospective population based cohort study if low social support, serious conflict at work, exclusion by superiors or exclusion by co-workers may predict depression.

Methods

Procedure

This study was conducted within the PART-project (acronym in Swedish for Psychiatric disorders, work and relations). From 1998 to 2000, 19,742 randomly selected persons aged 20 to 64 from Stockholm County were asked to respond to a questionnaire. This postal survey was answered by 10,441 persons (53%). In 2001–2003, the persons who participated in the first survey were asked to participate in a second phase with a largely identical questionnaire, (84% responded). Both postal surveys were answered by 8,613 individuals. For each individual there was approximately three years between the surveys. The surveys contained questions about: childhood conditions, education, financial situation, occupation, employment and working conditions and the like. Various

scales were included to measure mental health outcomes such as psychological well-being, depressive symptoms and anxiety symptoms.

Non-response analyses based on population registers from the first phase and from the second phase have been published. Both concluded that the prevalence of mental health problems in the respondent group was likely to be lower than among non-responders. However, associations between risk indicators and mental health problems were likely to be correctly depicted since associations between a number of exposure variables (income, civil status, education, etc) obtained from population registers and outcome variables (in-patient care or disability pension) were very similar between participants and non-participants. Moreover there was no difference between those who answered in the second phase and those who did not, regarding their answers on potential determinants for mental health problems at the first phase^{33, 34}).

Participants

For this study, 4,040 individuals (2,265 women and 1,775 men), were chosen who had held the same job over three years and had no missing values in the variables studied. The same job was defined as respondents not reporting any change of job or work tasks between the first and the second survey. This information was obtained through asking for all changes of work tasks or changes of workplaces that had occurred in-between the surveys, changes that had lasted more than six months.

Approval from the ethics committee at Karolinska Institutet was obtained for the study.

Measurements

Interpersonal relationships at work. Information about Social Support at Time 1 (T1) was obtained from the Swedish version of the job-content questionnaire, (JCQ)^{11, 35}). The index for social support contains five items regarding the social atmosphere in the workplace, the items are: "There is a calm and pleasant atmosphere at my workplace", "There is a good sense of fellowship", "My workmates support me", "If I have a bad day I'm met with acceptance", "I get on well with my superiors", "I get on well with my workmates". The four response alternatives are: "Perfectly true", "True", "Not true" and "Not at all true"³⁶). For each individual, the replies to each item were summed and the sumscores were dichotomized at the median. The question about serious conflict at work was included in a query on a number of different serious life events that may have occurred during the past 12 months at T1. The response alternatives for each event were: "Yes" or "No"³⁷). Exclusion by superiors at T1 was sought by the question: "Do you feel excluded by your superiors, (not being supplied with necessary information or being ignored)?" The response alternatives were: "Yes, to a large extent, to a certain extent, to a

small extent or not at all". The answers were dichotomized to create two groups containing those who answered: "Not at all" and those that had chosen any of the other alternatives. A question about exclusion by co-workers at T1 was handled in the same way as the question about exclusion by superiors. It was phrased identically with the exception that "Superiors" was replaced by "Co-workers".

Depression scale. The major depression inventory (MDI) at Time 2 (T2) was used as the outcome. The MDI can be used as a diagnostic criterion using an algorithm following the DSM-IV or ICD-10 or it can be used as a sumscore, scoring between 0 and 50³⁸. We used the sumscore and a cut-off of twenty points to create a dichotomous variable indicating depression or not. The MDI cut-off was chosen based on results from two validation studies, one from the first phase of the PART-study where the MDI was validated using schedules for clinical assessment in neuropsychiatry (SCAN) as the golden standard³⁹ and one clinical study from the official MDI manual⁴⁰. The same cut-off was also used in a Danish population-based study⁴¹.

Confounders. Nine variables were chosen as potential confounders based on known relations to mental health and their relations to the determinant variables. All confounders were obtained at T1. The variables were: age, severe conflict in family during childhood, education, financial situation, lacking a close friend or partner, severe life events, job demands, skill discretion, decision authority and depression at T1 (base line). Age was obtained through national registers and was divided into three groups: 20–34 yr, 35–49 yr, 50–64 yr. Severe conflict in family during childhood was divided into two categories: severe conflict and no or moderate conflicts. Education was divided into three different levels depending on completed studies: compulsory school (≤ 9 yr), upper secondary school or at most two years of university studies ($10 \leq 14$ yr) and at least three years of university studies ($15+$ yr). Financial situation was measured by asking if the subjects could raise "14,000 SEK" (about 1,500 euro) in a week if necessary. The response alternatives were "Yes", "No" and "Uncertain", which were dichotomized into two groups that answered either "Yes" or any of the other two response alternatives. Lack of a close friend or partner was derived from a Swedish modification of the interview schedule for social interaction (ISSI)⁴²; three questions on availability of attachment were used to create a dichotomous variable. Information about severe life events last year outside work was obtained according to Theorell and colleagues³⁷. Examples of severe life events outside work are: "separation/divorce", "conflict with spouse/friend", "close relative's death" and "serious illness". A sumscore was created counting the number of life events. This sumscore was dichotomized into "No severe life events"

and "One or more severe life events". Information on demands (5 questions), skill discretion (4 questions) and decision authority (2 questions) was obtained from the Swedish version of the JCQ^{11,35}. A sumscore for demands was dichotomised at the median into high or low demands. Skill discretion and decision authority were dichotomised in the same manner as demands. Depression at T1 was obtained using the MDI score dichotomised in the same way as at T2.

Data analysis

Frequencies for all variables in relation to depression according to the MDI at T2 and univariate odds ratios (OR) with 95% confidence intervals (CI 95%) were calculated. In multivariate logistic regressions, OR and CI 95% for the determinant variables were computed with all confounding variables controlled for using the statistical package SPSS, Version 16. All models tested effects on the MDI at T2. First, the crude OR for each determinant variable was computed and then adjusted for age (model 1). Then the potential confounder's severe conflict in family during childhood, financial situation, lacking a close friend or partner and severe life events was added (model 2). Then the potential work related confounders job demands, skill discretion and decision authority was added (model 3). Then education was entered (model 4). Finally depression according to MDI at T1 was added (model 5). We also made the same analysis as described above stratified by sex. In addition we performed an analysis with major depression based on the algorithm in DSM-IV, as the outcome. This analysis was not stratified by sex, due to the low prevalence (1% men and 4% women with major depression at T2).

Results

Two hundred and fifty-five individuals (6%) were depressed according to MDI only at the first phase of the study, 325 individuals (8%) were depressed only at the second phase, and 111 (3%) were depressed at both phases. Complete descriptive statistics for the study population may be found in Table 1.

Table 1 also shows that point estimates for the odds ratios for depression at T2 for those with unfavourable, compared to favourable, characteristics generally varied between 1.2 and 3.4. However depression, compared to no depression, at T1 was associated with an odds ratio for depression at T2 of about 13 at T2.

Associations between interpersonal relationships problems at work and depression

When adjusting for the confounders and previous depression according to MDI at T1, the ORs were reduced but remained significant as seen in Table 2 (low social support OR 1.5, CI 95% 1.1–2.0, serious conflict OR

Table 1. Number and frequencies (%) of exposed or not at T1 divided in to depressed or not at T2 and univariate odds ratios (OR) and 95% CI for depression at T2

Exposure	Not depressed T2 n (%)	Depressed T2 n (%)	Univariate OR (CI 95%)
High social support	2,170 (95)	124 (5)	1.0
Low social support	1,545 (88)	201 (12)	2.3 (1.8–2.9)
No serious conflict at work	3,174 (93)	233 (7)	1.0
Serious conflict at work	568 (86)	92 (14)	2.2 (1.7–2.8)
No exclusion by superiors	3,063 (94)	209 (6)	1.0
Exclusion by superiors	652 (85)	116 (15)	2.6 (2.0–3.3)
No exclusion by co-workers	3,258 (93)	239 (7)	1.0
Exclusion by co-workers	457 (84)	86 (16)	2.6 (2.0–3.3)
Sex-Male	1,693 (95)	82 (5)	1.0
Sex-Female	2,022 (89)	243 (11)	2.5 (1.9–3.2)
Age			
50–64 yr	1,241 (94)	86 (6)	1.0
35–49 yr	1,386 (91)	134 (9)	1.4 (1.1–1.8)
20–34 yr	1,088 (91)	105 (9)	1.4 (1.0–1.9)
No confl in childh family	3,358 (93)	259 (7)	1.0
Confl in childh family	357 (84)	66 (16)	2.4 (1.8–3.2)
No finacial difficulties	3,353 (93)	238 (7)	1.0
Financial difficulties	362 (81)	87 (19)	3.4 (2.6–4.4)
Close friend/partner	2,269 (94)	138 (6)	1.0
No close friend/partner	1,446 (88)	187 (12)	2.1 (1.7–2.7)
No life events	1,308 (96)	59 (4)	1.0
Life events	2,407 (90)	266 (10)	2.5 (1.8–3.3)
Low demands	2,373 (93)	181 (7)	1.0
High demands	1,342 (90)	144 (10)	1.4 (1.1–1.8)
High skill discretion	2,033 (93)	163 (7)	1.0
Low skill discretion	1,682 (91)	162 (9)	1.2 (0.9–1.5)
High decision authority	2,028 (94)	122 (6)	1.0
Low decision authority	1,687 (89)	203 (11)	2.0 (1.6–2.5)
Educational level			
University ≥ 3 yr	1,247 (94)	85 (6)	1.0
Secondary school/University	2,070 (92)	192 (8)	1.8 (1.2–2.6)
Compulsory school	398 (89)	48 (11)	1.4 (1.0–1.8)
No previous MDI	3,571 (94)	214 (6)	1.0
Previous MDI	144 (56)	111 (44)	12.9 (9.7–17.1)

1.4, CI 95% 1.1–1.9, exclusion by superiors OR 1.6, CI 95% 1.2–2.1 and exclusion by co-workers OR 1.7, CI 95% 1.2–2.3). Analyses stratified by sex showed that low social support after adjusting for confounders was significantly related to depression for men (OR 2.2, CI 95% 1.3–3.9) but not for women (OR 1.3, CI 95% 1.0–1.8). Serious conflict at work was not significantly related to depression for either sex (OR 1.4, CI 95% 0.9–1.9 for women and OR 1.5, CI 95% 0.8–2.8 for men). Exclusion by superiors was significantly related to depression after adjusting for confounders for both women and men (OR 1.6, CI 95% 1.1–2.2 for women and OR 2.2, CI 95% 1.3–3.7 for men) while exclusion by co-worker was

significantly related to depression only for women (OR 1.7, CI 95% 1.2–2.3 for women and OR 1.5, CI 95% 0.8–2.9 for men).

We repeated the same analyses as described in Table 2 with major depression according to the DSM-IV algorithm as the outcome. As shown the obtained point estimates (OR) were similar to the ones seen in Table 2. However, for exclusion by superiors the confidence interval included unity when adjusting for potential confounders.

Discussion

The results of this prospective cohort study show that

Table 2. Odds ratios (OR) and 95% CI for the relationship between interpersonal relationship problems at work measured at T1 and depression according to MDI at T2, for all and women and men

Exposure	Univariate OR (CI 95%)	Model 1 OR (CI 95%)	Model 2 OR (CI 95%)	Model 3 OR (CI 95%)	Model 4 OR (CI 95%)	Model 5 OR (CI 95%)
High social support	1.0	1.0	1.0	1.0	1.0	1.0
Low social support	2.3 (1.8–2.9)	2.3 (1.8–2.9)	1.8 (1.4–2.3)	1.7 (1.3–2.2)	1.7 (1.3–2.2)	1.5 (1.1–2.0)
Women	1.9 (1.5–2.5)	1.9 (1.5–2.5)	1.6 (1.2–2.1)	1.5 (1.1–2.0)	1.5 (1.2–2.0)	1.3 (1.0–1.8)
Men	3.6 (2.2–5.8)	3.6 (2.2–5.8)	2.5 (1.5–4.2)	2.6 (1.5–4.4)	2.5 (1.5–4.2)	2.2 (1.3–3.9)
No serious conflict at work	1.0	1.0	1.0	1.0	1.0	1.0
Serious conflict at work	2.2 (1.7–2.8)	2.2 (1.7–2.8)	1.7 (1.3–2.2)	1.6 (1.2–2.1)	1.6 (1.2–2.2)	1.4 (1.1–1.9)
Women	2.0 (1.5–2.7)	2.0 (1.5–2.7)	1.7 (1.2–2.3)	1.6 (1.2–2.2)	1.6 (1.2–2.2)	1.4 (0.9–1.9)
Men	2.4 (1.5–4.0)	2.4 (1.4–4.0)	1.7 (1.0–2.8)	1.6 (0.9–2.8)	1.6 (0.9–2.7)	1.5 (0.8–2.8)
No exclusion by superiors	1.0	1.0	1.0	1.0	1.0	1.0
Exclusion by superiors	2.6 (2.0–3.3)	2.6 (2.0–3.3)	2.0 (1.6–2.6)	1.9 (1.5–2.5)	1.9 (1.5–2.5)	1.6 (1.2–2.1)
Women	2.5 (1.8–3.3)	2.5 (1.8–3.3)	1.9 (1.4–2.6)	1.8 (1.3–2.5)	1.8 (1.3–2.5)	1.6 (1.1–2.2)
Men	3.5 (2.2–5.5)	3.4 (2.2–5.4)	2.5 (1.6–4.1)	2.6 (1.6–4.2)	2.5 (1.5–4.1)	2.2 (1.3–3.7)
No exclusion by co-workers	1.0	1.0	1.0	1.0	1.0	1.0
Exclusion by co-workers	2.6 (2.0–3.3)	2.6 (2.0–3.4)	2.0 (1.5–2.6)	1.9 (1.4–2.5)	1.9 (1.4–2.5)	1.7 (1.2–2.3)
Women	2.5 (1.8–3.4)	2.5 (1.8–3.4)	2.0 (1.4–2.7)	1.9 (1.4–2.7)	1.9 (1.4–2.7)	1.7 (1.2–2.3)
Men	2.3 (1.3–4.0)	2.3 (1.3–4.0)	1.7 (0.9–3.0)	1.6 (0.9–2.9)	1.6 (0.9–2.9)	1.5 (0.8–2.9)

Model 1: All exposure variables adjusted for age. Model 2: All exposure variables adjusted for age, severe conflict in family during childhood, financial situation, lacking a close friend or partner and severe life events. Model 3: All exposure variables adjusted for age, severe conflict in family during childhood, financial situation, lacking a close friend or partner, severe life events, job demands, skill discretion and decision authority. Model 4: All exposure variables adjusted for age, severe conflict in family during childhood, financial situation, lacking a close friend or partner, severe life events, job demands, skill discretion, decision authority and education. Model 5: All exposure variables adjusted for age, severe conflict in family during childhood, financial situation, lacking a close friend or partner, severe life events, job demands, skill discretion, decision authority, education and depression according to MDI from the first phase of the PART study.

low social support at work, serious conflict at work and exclusion by superiors or by co-workers were associated with depression. The odds ratios were reduced when taking all potential confounders into account. The confounders which reduced the odds ratios most seem to have been the non-work related variables (model 2) and depression at T1 (model 5) as seen in Table 2.

Individuals that did not change work place or tasks over a three-year period were selected as the study population. This was done in order to reduce variation in the exposure variables due to work turnover. However, this may lead to an underestimation of the odds ratios if those not included in the analysis showed more depression as well as higher exposure compared to those included.

In this study, exposures as well as the outcome were self-reported. If the outcome is associated with over-reporting of the exposure, it would result in improperly inflated risk estimates. Waldenström *et al.*^{16, 43)} have shown that the risk of over-reporting negative working conditions among those with depressive symptoms may be exaggerated. However, we have partly diminished

the risk of such common method variance by controlling for depression at T1 (base-line).

Investigating conflict at work using only one question, open for broad interpretations with just yes or no as possible answers, is a crude and imprecise method. The way people interpret what constitutes serious conflict, might differ in many ways¹²⁾, which may lead to non-differential misclassification of the exposure and consequent underestimations of the odds ratios. Using composite score variables and more objective methods to measure conflicts would be ways of enhancing reliability and validity and would make an interesting target for further studies.

The MDI is a self-report scale to assess depression. We chose a cut-off at 20 points, based on recommendations by Forsell and others^{39–41)}. In Forsell's article, evaluating self-reported depression according to the MDI vs. clinically-assessed depression using SCAN in a population sample, it was concluded that a 20-point cut-off was optimal in terms of the combination of sensitivity (0.74) and specificity (0.73) for major

Table 3. Number, odds ratios (OR) and 95% CI for the relationship between interpersonal relationship problems at work measured in the first phase of the PART study and depression according to DSM-IV in the second phase of the PART study

Exposure	n (%)	Univariate	Adjusted ^a
High social support	2,294 (57)	1.0	1.0
Low social support	1,746 (43)	2.4 (1.6–3.5)	1.5 (1.0–2.4)
No serious conflict at work	3,380 (84)	1.0	1.0
Serious conflict at work	660 (16)	2.4 (1.6–3.4)	1.6 (1.0–2.5)
No exclusion by superiors	3,272 (81)	1.0	1.0
Exclusion by superiors	768 (19)	2.7 (1.8–4.0)	1.8 (1.2–2.8)
No exclusion by co-workers	3,497 (87)	1.0	1.0
Exclusion by co-workers	543 (13)	2.4 (1.5–3.7)	1.4 (0.8–2.2)

^aAll exposure variables adjusted for age, severe conflict in family during childhood, financial situation, lacking a close friend or partner, severe life events, job demands, skill discretion, decision authority, education and depression according to DSM-IV from the first phase of the PART study.

depression and sensitivity (0.63) and specificity (0.81) for all depressive disorders³⁹). We also performed an analysis using the algorithm for the DSM-IV criterion for major depression. The results from these calculations were similar to the results obtained with the 20 point cut-off as seen in Table 3.

Information on the determinant variables was obtained at baseline and on the outcome variables at the follow-up about three years later. A period of three years may be too long and spuriously diminish true effects due to non-differential misclassification, but this study still found apparent effects, which might have been stronger if a shorter time-period had been applied. A general problem connected with panel studies is that they mostly consist of data from two or more data collections with one or more years between them where the duration of exposure or the outcome are not known. The effect in these studies is considered to be caused by the exposure variable from an earlier data collection, when the outcome was not present, if this exposure variable is correlated to the outcome collected later. However, it cannot be ruled out that what is considered an effect may be due to a synchronous correlation between the exposure variable and the outcome variable only in the later data collection and the auto-correlation of the exposure variables between the two data collections. The ideal study design would probably be a prospective study with a large sample regularly interviewed at short time intervals.

At least one recent study has shown indications of gender differences regarding the relations between working conditions and depression⁴⁴). However, we did not find indications of such differences in our analyses since confidence intervals for the point estimates showed considerable overlap between the sexes. Thus, in our study the risk of developing depression due to problematic interpersonal relationships at work seems have been

similar for women and men.

That low social support had a possible longitudinal effect was in accordance with findings from previous studies with psychological distress and/or psychiatric morbidity as the outcomes^{6, 8–10, 12, 15–22}). Stansfeld, Furher and Shipley¹⁹) tested the relationship for types of social support, emotional, instrumental and negative aspects of close relationships, and concluded that low emotional support was associated with greater risks of depression. Our social-support-at-work-scale, which measures an emotional aspect of support, was related to depression.

Due to the small number of studies that investigate conflicts at work in relation to depression, comparisons have to be made with studies from outside the work field. As pointed out in the Introduction Brown and Harris have shown that life events and difficulties involving humiliation and entrapment are likely to cause depression. Whether or not a conflict at work is humiliating depends on whether there are elements of demeaning remarks and the subject loses pride in front of others³²). We do not know how the individuals in our study in general experience interpersonal relationship problems at work, but it is plausible that, for example, being excluded in any way at work, not being invited to social events or not being given information, may be experienced as humiliating. Entrapment may also be important. Individuals may fear the consequences of leaving their job and thus remain trapped in degrading environments.

Exclusion by superiors or by co-workers was in this study related to depression and this is in accordance with studies showing that mobbing or harassment is related to impaired mental health^{29–31}). It can be argued that exclusion is not necessarily the same as being victim of mobbing or harassment and different ways of conceptualizing mobbing and harassment have been presented^{29–31}). However, Zapf and colleagues³⁰) consider

social isolation an indicator of mobbing and an important, but little studied, social stress factor at work. They also suggest that social isolation may be related to depression.

In conclusion, low social support, severe conflict and exclusion by superiors or by co-workers seemed to be determinants of depression. Further studies over shorter time periods, with diagnosis of depression obtained using interviews and dating of the first occurrence during the studied period are needed to confirm the results. Our findings may have implications for the prevention of depression and the rehabilitation of depressed patients. Early identification and targeting of problematic interpersonal relationships problems at the workplace may help to diminish the risk of employees developing depression. Such measures may also increase the opportunities for depressed persons to return to work.

Acknowledgments: The study was supported by grants from the Swedish Council for Work life and Social research (FAS) (grants nr 2002-0512) and AMF-AFA (grants nr PA-05:00).

References

- 1) The World Health Report: 2004: Changing History. Geneva: WHO; 2004.
- 2) Folkhälsorapport 2005. Epidemiologiskt Centrum, Socialstyrelsen. Stockholm (Sweden): National Board of Health and Welfare; 2005 (in Swedish).
- 3) Fleming JA, Hsieh C. Introduction to Epidemiology. In: Tsuang M, Tohen M, editors. Textbook in Psychiatric Epidemiology. New York (NY): Wiley-Liss Inc.; 2002. p.3–33.
- 4) Kawakami N, Araki S, Kawashima M. Effects of job stress on occurrence of major depression in Japanese industry: A case-control study nested in a cohort study. *J Occup Med* 1990; 32: 722–5.
- 5) De Lange AH, Taris TW, Kompier MAJ, Houtman ILD, Bongers PM. The relationship between work characteristics and mental health: Examining normal, reversed and reciprocal relationships in a 4-wave study. *Work & Stress* 2004; 18: 149–66.
- 6) Paterniti S, Niedhammer I, Lang T, Consoli SM. Psychosocial factors at work, personality traits and depressive symptoms. Longitudinal results from the GAZEL Study. *Br J Psychiatry* 2002; 181: 111–7.
- 7) Stansfeld SA, Fuhrer R, Shipley MJ, Marmot MG. Work characteristics predict psychiatric disorder: Prospective results from the Whitehall II Study. *Occup Environ Med* 1999; 56: 302–7.
- 8) Stansfeld S, Candy B. Psychosocial work environment and mental health—a meta-analytic review. *Scand J Work Environ Health* 2006; 32: 443–62.
- 9) Bonde JPE. Psychosocial factors at work and risk of depression: A systematic review of the epidemiological evidence. *Occup Environ Med* 2007; 65: 438–45.
- 10) Netterstrom B, Conrad N, Bech P, Fink P, Olsen O, Rugulies R, Stansfeld S. The relation between work-related psychosocial factors and the development of depression. *Epidemiol Rev* 2008; 30: 118–32.
- 11) Karasek R, Theorell T. Healthy work. Stress, productivity and the reconstruction of working life. New York (NY): Basic Books; 1990.
- 12) Appelberg K. Interpersonal conflicts at work: impact on health behavior, psychiatric morbidity and work disability. Helsinki (Finland): Finnish Institute of Occupational Health; 1996. p.167.
- 13) Narayanan L, Menon S, Spector PE. Stress in the workplace: a comparison of gender and occupations. *J Organ Behav* 1999; 20: 63–73.
- 14) Appelberg K, Romanov K, Heikkila K, Honkasalo ML, Koskenvuo M. Interpersonal conflict as a predictor of work disability: a follow-up study of 15,348 Finnish employees. *J Psychosom Res* 1996; 40: 157–67.
- 15) Dormann C, Zapf D. Social support, social stressors at work, and depressive symptoms: Testing for main and moderating effects with structural equations in a three-wave longitudinal study. *J Appl Psychol* 1999; 84: 874–84.
- 16) Waldenstrom K, Ahlberg G, Bergman P, et al. Externally assessed psychosocial work characteristics and diagnoses of anxiety and depression. *Occup Environ Med* 2008; 65: 90–6.
- 17) Johnson JV, Hall EM. Job strain, work place social support, and cardiovascular disease: A cross-sectional study of a random sample of the Swedish working population. *Am J Public Health* 1988; 78: 1336–42.
- 18) De Lange AH, Taris TW, Kompier MAJ, Houtman ILD, Bongers PM. The very best of the Millennium: Longitudinal research and the Demand-Control-(Support) model. *J Occup Health Psychol* 2003; 8: 282–305.
- 19) Stansfeld S, Furher R, Shipley M. Types of social support as predictors of psychiatric morbidity in cohort of British Civil Servants (Whitehall II Study). *Psychol Med* 1998; 28: 881–92.
- 20) Stansfeld S, Rael EGS, Shipley M, Marmot MG. Social support and psychiatric sickness absence: a prospective study of British civil servants. *Psychol Med* 1997; 27: 35–48.
- 21) Niedhammer I, Goldberg M, Leclerc A, Bugel I, David S. Psychosocial factors at work and subsequent depressive symptoms in the Gazel cohort. *Scand J Work Environ Health* 1998; 24: 197–205.
- 22) Wang J. Perceived work stress and major depressive episodes in a population of employed Canadians over 18 years old. *J Nerv Ment Dis* 2004; 192: 160–3.
- 23) Waldenstrom M, Theorell T, Ahlberg G, Josephson M, Nise P, Waldenstrom K, Vingard E. Assessment of psychological and social current working conditions in epidemiological studies: experiences from the MUSIC-Norrtaälje study. *Scand J Public Health* 2002; 30: 94–102.
- 24) De Dreu CWK, Beersma B. Conflict in organizations: Beyond effectiveness and performance. *Euro J Work Organ Psychol* 2005; 14: 105–17.
- 25) De Dreu CWK, Weingart LR. Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. *J Appl Psychol* 2003; 88:

- 741–9.
- 26) Dijkstra MT, Van Dierendock D, Evers A. Responding to conflict at work and individual well-being: The mediating role of flight behavior and feelings of helplessness. *Euro J Work Organ Psychol* 2005; 14: 119–35.
 - 27) Giebels E, Janssen O. Conflict stress and reduced well-being at work: The buffering effect of third-party help. *Euro J Work Organ Psychol* 2005; 14: 137–55.
 - 28) Guerra JM, Martinez I, Munduate L, Medina FJ. A contingency perspective on the study of the consequences of conflict types: The role of organizational culture. *Euro J Work Organ Psychol* 2005; 14: 157–76.
 - 29) Maarit MA-L, Vartia MA. Consequences of workplace bullying with respect to the well being of its targets and the observers of bullying. *Scand J Work Environ Health* 2001; 27: 63–9.
 - 30) Zapf D, Knorz C, Kulla M. On the relationship between mobbing factors and job content, social work environment and health outcomes. *Euro J Work Organ Psychol* 1996; 5: 215–37.
 - 31) Kivimäki M, Virtanen M, Vartia M, Elovainio M, Vahtera J, Keltikangas-Jarvinen L. Workplace bullying and the risk of cardiovascular disease and depression. *Occup Environ Med* 2003; 60: 779–83.
 - 32) Brown GW, Harris T. *Social Origins of Depression*. Cambridge (Great Britain): University Printing House; 1978.
 - 33) Lundberg I, Damström-Thakker K, Hällström T, Forsell Y. Determinants of non-participation and the effects of non-participation on potential cause-effect relationships, in the PART study on mental disorders. *Soc Psychiatry Psychiatr Epidemiol* 2005; 40: 475–83.
 - 34) Bergman P, Ahlberg G, Forsell Y, Lundberg I. Non-participation in the second wave of the Part study on mental disorders and its effects on risk estimates. *Int J Soc Psychiatry* (in Press).
 - 35) Karasek R, Brisson C, Kawakami N, Houtman I, Bongers P, Amick B. The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *J Occup Health Psychol* 1998; 3: 322–55.
 - 36) Ahlberg-Hultén GK, Theorell T, Sigala F. Social support, job strain and musculoskeletal pain among female health care personnel. *Scand J Work Environ Health*, 1995; 21: 435–9.
 - 37) Theorell T, Lind E, Flodéus B. The relationship of disturbing life-changes and emotions to early development of myocardial infarction and other serious illnesses. *Int J Epidemiol* 1975; 4: 281–93.
 - 38) Bech P, Rasmussen NA, Olsen LR, Noerholm V, Abildgaard W. The sensitivity and specificity of the Major Depression Inventory, using the Present State Examination as the index of diagnostic validity. *J Affect Disord* 2001; 66: 159–64.
 - 39) Forsell Y. The Major Depression Inventory versus Schedules for Clinical Assessment in Neuropsychiatry in a population sample. *Soc Psychiatry Psychiatr Epidemiol* 2005; 40: 209–13.
 - 40) Olsen LR, Jensen DV, Noerholm V, Martiny K, Bech P. The internal and external validity of the major depressive inventory in measuring severity of depressive states. *Psychol Med* 2003; 33: 351–6.
 - 41) Olsen LR, Mortenson EL, Bech P. Prevalence of major depression and stress indicators in the Danish general population. *Acta Psychiatrica Scandinavica* 2004; 109: 96–103.
 - 42) Henderson S, Duncan-Jones P, Byrne D. Measuring social relationships. The interview schedule for social interaction. *Psychol Med* 1980; 723–34.
 - 43) Waldenstrom K, Lundberg I, Waldenstrom M, Härenstam A, MOA Research Group. Does psychosocial distress influence reporting of demands and control at work. *Occup Environ Med* 2002; 60: 887–91.
 - 44) Rugulies R, Bultmann U, Aust B, Burr H. Psychosocial work environment and incidence of severe depressive symptoms: Prospective findings from a 5-year follow-up of Danish work environment cohort study. *Am J Epidemiol* 2006; 163: 877–87.