

ORIGINAL ARTICLE

Psychosocial conditions on and off the job and psychological ill health: depressive symptoms, impaired psychological wellbeing, heavy consumption of alcohol

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Background: Psychiatric epidemiology has revealed a number of associations between gender, socioeconomic status, and psychiatric disorders.

Aims: To examine psychosocial conditions on and off the job in relation to psychological ill health.

Methods: Longitudinal design with 24 year follow up of employed persons (190 women, 177 men). Interview and questionnaire data on work and leisure conditions were collected in 1969 and 1993. Risk analyses were performed in relation to three outcomes in 1993: depression within the preceding 12 months, impaired psychological wellbeing, and heavy alcohol use.

Results: Thirteen per cent of the women and 11% of the men showed symptoms of depression, 21% and 22% had impaired psychological wellbeing, and 7% and 15% respectively were heavy alcohol users. Dissatisfaction with the quality (women) or quantity (men) of social contacts 24 years earlier was a significant risk factor for depression. Dissatisfaction with the quality of social contacts was also associated with impaired psychological wellbeing (among women), and dissatisfaction with leisure time activities was associated with heavy alcohol use (among men). Frequent overtime work 24 years earlier was associated with heavy alcohol use among women. Cross sectional analyses also showed associations between psychological ill health and some work related factors (mentally demanding work and lack of job pride).

Conclusions: Perceived inadequacies in social contacts, and practical obstacles to social relationships are viewed as risk factors for depression. In this longitudinal study, work related factors, including mental demands and time pressure, do not appear sufficiently associated with psychological ill health.

Psychiatric epidemiology has revealed a number of associations between gender, socioeconomic status, and various types of psychiatric disorders.^{1,2} There is a heightened risk of psychiatric disorders among people with low socioeconomic status; the associations with schizophrenia are clear, as are those with depression.^{3,4} The associations between education and depression have been shown to grow stronger with increasing age.⁵ According to multifactorial models, a variety of environmental factors from early childhood and onward can be of importance for the development of psychiatric disorders.^{6–8} There are many indications that in addition to the general associations between socioeconomic status and psychiatric disorders, specific factors, for instance in the working environment, can play an important role. Studies of associations between working conditions and psychological ill health are few, and the need for more research has been pointed out.^{9,10} For people with certain occupations, for example social workers, factory line workers, salespeople, lawyers, teachers, and secretaries, the prevalence of depression has been shown to be particularly high.¹¹ The aetiology of psychiatric disorders, in particular depression and anxiety, can be affected by high demands and little possibility to plan and control one's work, by major changes in the work, and by deficient social support.^{12–18} Long term exposure to these types of job demands, or short term exposure to extremely demanding working conditions, can be risk factors that may contribute to or trigger psychiatric disorders.

Studies of psychological and social conditions in occupational settings have usually been put in relation to end points such as cardiovascular disease and musculoskeletal disorders.^{19,20} Many associations have been found showing that occupations characterised by strong psychological demands in combination with lack of control and decision lati-

tude are risk factors for cardiovascular and musculoskeletal disorders. On the other hand, a social support network in the workplace has been shown to have a protective effect against these types of disease.^{21,22}

Work environment studies concerning psychological ill health have seldom used specific diagnostic criteria such as DSM²³ to evaluate psychiatric health. Rather, researchers have usually noted the presence and prevalence of just a few symptoms, often based on self administered questionnaires for milder forms of psychiatric problems. One form used frequently is the General Health Questionnaire (GHQ), which was developed to reflect psychological wellbeing.^{24,25} Most studies have also relied on cross sectional data.¹⁸ This can be

Main messages

- Inadequacies in social contacts 24 years back in time constitute risk factors for depression in the working population.
- Working conditions such as high mental load and lack of job pride are in cross sectional data associated with psychological ill health.
- Further studies are needed concerning interpersonal relationships on the job and during leisure time in relation to psychological ill health.

Policy implications

- To improve mental health in the working population, management must facilitate the development of interpersonal relationships and social support.

quite tricky, especially if the aim is to elucidate a possible effect of the psychosocial conditions a person has experienced at work, and the outcome measure is psychological ill health. To our knowledge, no studies have been carried out where psychosocial conditions both in and out of working hours have been analysed in relation to psychological ill health.

The aim of this study was to elucidate psychological and social conditions both at work and during leisure time in relation to symptoms of depression, impaired psychological well-being, and increased alcohol intake. An additional aim was to study these phenomena on the basis of both cross sectional and longitudinal data.

MATERIALS AND METHODS

The study design was longitudinal with two examinations carried out 24 years apart. Separately, cross sectional analyses have also been undertaken on data from each of the two examinations. The study group consisted of 367 people (190 women and 177 men, aged 42–58) and employed at the time of the second examination in 1993/94. The study group was constructed as described below.

Material from an earlier population based study carried out in 1969/70 was used,²⁶ and these data constitute the baseline in the present study. Participants in 1969/70 were 2579 women and men (84% of the eligible study group), aged 18–65 years, representative of the population living in the county of Stockholm at that time. The aims of the study in 1969/70 were: (1) to chart the need for medical and social service for the county residents; and (2) to determine how well those needs were met. The subjects were randomly selected in an age stratified manner where the number of subjects selected from the youngest age groups was enhanced in order to get sufficiently frequent occurrences of certain disorders.²⁷ The non-respondents in 1969/70 (16%) were compared to the participants with regard to their sick leave and socioeconomic status; agreement between the groups was good.²⁶

The participants were examined in depth medically and socially by physicians and social workers using structured interviews and evaluations; data were collected on family situation, health status, working conditions, and leisure time conditions. Data collection was carried out in four in principle equivalent phases in 1969/70. During three of these phases, psychiatrists also took part in order to strengthen the evaluation of the person's psychiatric status and functionality alongside the examination of health and social conditions.²⁸ The entire database from 1969/70 was available when the re-examination was being planned. Some data could not be used, however, because of imprecision in the measurements; these include data on tobacco and alcohol use.

Several topics were of relevance for the re-examination (1993/94); for example, risk factors for disorders of the musculoskeletal system and physical abilities,^{29–30} and questions concerning risk factors for psychiatric symptoms and alcohol consumption, the focus of this study.

In 1993/94, previously examined subjects were included in the re-examination if they fulfilled the following criteria: they were residents of Sweden in 1993/94 and could be identified in address lists; they were between 42 and 58 years of age; and they had been evaluated by a psychiatrist at the first examination. A total of 677 people met these criteria. They were the youngest among those studied in 1969/70. In other words, the youngest participants had been 18 at the time of the first study. The age band 42–58 represents a rather narrow interval in the upper age range of the workforce. In this interval, early retirement was not very common.

People with musculoskeletal diagnosis or serious psychiatric diagnoses, alcoholism, or mental retardation in 1969/70 were excluded, corresponding to 1.2% of those who met the inclusion criteria. The rationale for this was that these people would not have been employed very much between 1969/70

and 1993/94. Of those who qualified, 408 people (60%) participated. Not all of these were employed in 1993/94: 33 were unemployed and eight had gone into early retirement and were therefore excluded from the study. The proportion of unemployed was approximately that which could be expected, considering the unemployment rate among people in the 42–58 year age bracket in the Greater Stockholm area at the time. Where socioeconomic status and level of education were concerned, the study group also corresponded with the population in the same age bracket in Stockholm in 1993/94.²⁹

Data collection

Background information was collected about the subjects and dichotomised: gender, age (42–50/51–58), and education as number of years in school (<9 years/more). At both examinations, a note was made of the subject's marital status (living alone or with a partner), whether or not he/she had children living at home, and at the second examination, whether the person smoked regularly. Socioeconomic groups were determined at both examinations, in 1969/70 and in 1993/94, on the basis of the subject's occupation and were roughly divided into white or blue collar worker groups.

1969/70

At the first examination, data were collected on working and leisure conditions by means of a structured interview based on a form with answers on a dichotomised scale (see Appendix 1). Three work related exposures dealt with working time, night or shift work, and overtime work. Four exposures concerned how the subject felt about his or her job, if the person experienced high mental load at work, considered the job tasks monotonous, felt the job to be hectic/stressful, and whether he/she got any social support from superiors.

Leisure conditions were examined through five exposures: leisure time per day, satisfaction/dissatisfaction with leisure activities, social contacts, satisfaction/dissatisfaction with social contacts, and, finally, whether or not the person was responsible for housework and children in addition to holding a paying job.

The outcome measures of the first examination (1969/70) took the form of psychiatrists' evaluations from structured interviews for psychological symptoms and functionality. The evaluations were done according to a manual based on the WHO manual for classification of disease ICD 8.³¹ The subjects were evaluated by two clinically experienced psychiatrists well acquainted with the classification system. It was found that one of the psychiatrists had a somewhat broader definition of what constituted a psychiatric diagnosis, but this was constant over the entire time when the data were collected.³² Data from the examination (1969/70) have since been grouped according to symptom criteria set forth in DSM-III-R.²³

1993/94

At the re-examination, data were collected concerning conditions at work and in leisure time by means of questionnaires that were completed at the time of the examination. The same seven questions about working conditions from 1969/70 (see Appendix 1) were asked once more, now as a questionnaire with dichotomised answers and focused on the conditions in 1993/94. Two questions about leisure time were used, namely one about hours of leisure time and one about frequency of social contacts (see Appendix 2). The questionnaire about working conditions also included another set of questions, five simple questions and another 21 questions that are included in five indices (see Appendix 2). The simple questions, which were dichotomised for evaluation, concerned: time pressure, high demands on skill, low demands on skill, possibilities for further learning at work, and frequent contact with clients. Four of the indices have been used frequently in studies of working conditions, especially those focused on cardiovascular disease,¹⁹ and one index, dealing with commitment and

Table 1 Prevalence of outcomes and intercorrelations between outcome variables (women, n=190; men, n=177)

	Women		Men	
	n	%	n	%
(A) Outcomes*				
Depr 93/94	25	13	19	11
Alc 93/94	14	7	27	15
Low GHQ	39	21	39	22
Depr 69/70	42	22	23	13
	Women		Men	
	Correlation	p	Correlation	p
(B) Correlations between the four outcomes				
Depr 93/94 / Alc 93/94	0.13	0.08	-0.05	0.53
Depr 93/94 / Low GHQ	0.24	0.00	0.35	0.00
Alc 93/94 / Low GHQ	0.01	0.94	0.08	0.30
Depr 69/70 / Depr 93/94	0.17	0.02	0.08	0.29
Depr 69/70 / Alc 93/94	0.14	0.05	-0.12	0.12
Depr 69/70 / Low GHQ	0.17	0.02	0.28	0.00

*Symptoms of depression 93/94 (Depr 93/94), heavy use of alcohol 93/94 (Alc 93/94), impaired psychological wellbeing 93/94 according to GHQ 12 (Low GHQ), and symptoms of depression 69/70 (Depr 69/70).

job pride, was constructed especially for this study. The five indices concerned: psychological demands at work (five items), skill discretion at work (four items), authority over decisions (two items), social support at work (six items), and feelings of job pride (four items). Together the two indices skill discretion and authority over decisions constitute the decision latitude within the demand-control model.¹⁹ All the index questions were multiple choice, with four alternatives. All five indices were dichotomised at the 75th centile.

Outcome measures were obtained in three ways. Symptoms of depression over the 12 months preceding the re-examination were obtained through an interview based on questions concerning symptoms and the DSM-III-R criteria.²³ For a diagnosis of depression, five of these symptoms were required. In this study, the reported data were dichotomised such that a person was classified as having symptoms of depression only if at least two symptoms had been present simultaneously during the preceding 12 months. This classification can be considered to identify also a subclinical group of persons. The interviews were conducted by a psychologist with psychiatric training. Twenty four interviews were selected randomly and taped, and another psychologist evaluated them as well. The agreement between these two psychologists concerning symptoms of depression was 90%. Psychological wellbeing was evaluated with the questionnaire GHQ 12,²⁴ and the results were dichotomised at the 75th centile: higher values were taken as indicators of impaired psychological wellbeing. Alcohol intake was examined through questionnaire items concerning average weekly consumption of beer, wine, and spirits over the past year. The amounts were recalculated as corresponding grams of pure alcohol and this was dichotomised. Heavy alcohol consumption was defined as more than 105 grams weekly for women and more than 140 grams weekly for men.³³

The project was examined and approved by the Research Ethics Committee of the Karolinska Institute, Stockholm, Sweden. All participants were given written information about the project in which it was made clear that participation was voluntary.

Statistical analysis

Prevalence data have been calculated for all background characteristics, leisure related and work related variables for women and men separately, as have all the outcome measures. Correlations have been calculated pairwise between all outcome measures.

Bivariate analyses, adjusted for age, with 95% confidence intervals, according to Mantel-Haenszel,³⁴ were done on background characteristics and psychosocial variables at work and in leisure time in 1969/70 in relation to outcome measures in 1993/94: symptoms of depression, signs of impaired psychological wellbeing according to GHQ 12 (75th centile), and heavy alcohol consumption. Corresponding analyses were carried out with background characteristics, work related and leisure related variables in 1993/94 in relation to the three outcome measures in 1993/94. The analyses were carried out with the module PROC FREQ in the SAS statistical software.³⁵ In addition, bivariate analyses were carried out with background characteristics, work related and leisure related variables in 1969/70 in relation to the outcome measure symptoms of depression in 1969/70, in order to examine the older material as a cross sectional study from 1969/70.

Multivariate analyses with logistic regression, with the module PROC LOGISTIC in the SAS statistical software,³⁵ were carried out for the variables that showed significance in the bivariate analyses. These analyses were done separately regarding longitudinal data and cross sectional data.

All analyses were carried out separately for men and women.

RESULTS

Of the 367 people examined, all of whom were employed in 1993/94, 13% of the women and 11% of the men showed at least two signs of depression according to the DSM-III-R criteria. Impaired psychological wellbeing, according to GHQ 12, was seen in 21% of the women and 22% of the men. Among men, heavy alcohol consumption was reported by 15% and among women the corresponding value was 7% (table 1A).

The association between the three outcome measures in 1993/94 (that is, symptoms of depression, impaired psychological wellbeing, and heavy alcohol consumption) was strongest between symptoms of depression and impaired psychological wellbeing ($r = 0.24$ for women and $r = 0.35$ for men; table 1B). The weakest association was between heavy alcohol use and reduced psychological wellbeing.

The prevalence of symptoms of depression in 1969/70 was 22% for women and 13% for men (table 1A). The association between symptoms of depression at the two examinations (1969/70 and 1993/94) was $r = 0.17$ for women and $r = 0.08$ for men. Among women, symptoms of depression in 1969/70 was a significant relative risk for symptoms of depression in

Table 2 Prevalence (%) of exposure to potential risk factors (background, leisure time, and work related variables) in 1969 and 1993 among employed subjects by gender (women, n=190; men, n=177)

	1969		1993	
	Women	Men	Women	Men
Background				
Age (51–58 in 1993)			31	33
Education (<9 years)			55	69
Living alone	20	45	22	17
Children at home	59	43	37	47
Smoker			24	23
Leisure time				
No time for oneself, <1 h/day	17	10	20	15
Dissatisfaction with leisure activities	28	25		
Infrequent social contact, <once/month	3	4	31	40
Dissatisfaction with social contacts	17	17		
Responsible for home and children	23	7		
Work related variables				
Blue collar worker	40	48	32	34
Full time employment	60	93	72	90
Night or shift work	7	6	20	18
Overtime work	6	48	32	46
High mental load	31	47	36	26
Monotonous work	11	15	6	7
Hectic work	43	66	70	64
Poor social support from superiors	46	17	12	15
Time pressure			33	32
Excessive demands on skills			23	20
Low demands on skills			15	14
Few possibilities to learn new things			25	13
Frequent contacts with clients			49	43
Index				
Psychological demands			30	26
Low degree of skill discretion			25	14
Low authority over decisions			42	29
Poor social support			18	31
Lack of job pride			17	18
Exposed both 1969 and 1993 (as % of the exposed in 1969)			Women	Men
Work related variables				
Blue collar worker			55	33
Full time employment			72	90
Night or shift work			45	22
Overtime work			30	40
High mental load			44	45
Monotonous work			18	21
Hectic work			72	72
Poor social support from superiors			12	22

1993/94 (RR = 2.41; 95% CI 1.17 to 4.96); this was not true for men (RR = 1.75; 95% CI 0.63 to 4.91).

Data were available concerning potential risk factors in the subject's personal characteristics, in leisure time and at work (table 2) for both 1969/70 and 1993/94. For some of these factors, the number of subjects exposed changed considerably between 1969/70 and 1993/94. Among the background characteristics, the number of single men decreased (from 45% to 17%) as did the number of women with children living at home (from 59% to 37%). The percentage of the subjects—both men and women—who had little social life outside work increased by a factor of 10, perhaps owing to accelerating urbanisation over the time period with difficulties to maintain direct contact with friends and family due to long distances in a sparsely populated country like Sweden.

Among the work related factors, the proportion of blue collar workers decreased, especially among men, whereas the proportion who worked at night or in shifts increased in both sexes and overtime work increased among women. The percentage of the men with jobs that were either mentally very demanding or monotonous decreased. Among women, the percentage who experienced hectic work increased and the percentage who lacked social support from superiors decreased (table 2).

For some of the work related factors a high proportion of the subjects were exposed in both 1969/70 and in 1993/94 (as percentage of the exposed in 1969/70): full time employment (women 72%, men 90%); and hectic work (in both sexes 72%). On the other hand a small number of subjects were exposed at both times to monotonous work (women 18%, men 21%) and poor social support from superiors (women 12%, men 22%) (table 2).

The age adjusted bivariate analyses of background characteristics and outcome measures showed that for both men and women, education levels were not associated with the end points depression in 1969/70 or 1993/94, heavy alcohol consumption, or GHQ 12. The same could be said of the variable white collar/blue collar job.

Depression

The age adjusted bivariate analyses concerning longitudinal data with exposures present in 1969/70 in relation to "depression in 1993/94" showed that among women, dissatisfaction with social contacts was significant, entailed a fourfold relative risk (RR = 4.09; 95% CI 2.07 to 8.06). Among men, few social contacts was a risk factor, also giving over a fourfold relative risk (RR = 4.39; 95% CI 1.51 to 12.7). None of the

Table 3 Multivariate analyses in relation to the outcome measures depression, impaired psychological wellbeing, and heavy alcohol use for risk factors that showed significance in bivariate analysis; by gender in age adjusted analysis

Risk factor	Bivariate analysis		Multivariate analysis	
	RR	95% CI	RR	95% CI
(A) Outcome: depression				
<i>Longitudinal data, 1969–93</i>				
Women				
Depression 69	2.41	1.17 to 4.96	2.68	1.04 to 6.89
Dissatisfaction with social contacts 69	4.09	2.07 to 8.06	5.58	2.17 to 14.31
Men				
Infrequent social contact 69	4.39	1.51 to 12.7	*	
<i>Cross sectional data in 1993</i>				
Women				
Living alone 93	2.48	1.21 to 5.11	2.97	1.19 to 7.42
Lack of job pride 93	2.66	1.28 to 5.54	3.28	1.27 to 8.45
Men				
Living alone 93	2.80	1.20 to 6.52	3.69	1.19 to 11.45
High mental load at work 93	2.54	1.00 to 6.47	2.56	0.86 to 7.57
<i>Cross sectional data in 1969</i>				
Women				
High mental load at work 69	2.14	1.21 to 3.80	*	
Men				
Infrequent social contact 69	3.58	1.24 to 10.3	3.34**	0.52 to 21.34
Dissatisfaction with social contacts 69	2.28	1.05 to 4.97	2.70**	0.97 to 11.07
Monotonous work	2.68	1.03 to 6.99	3.28**	0.86 to 8.42
(B) Outcome: GHQ 12				
<i>Longitudinal data, 1969–93</i>				
Women				
Dissatisfaction with social contacts 69	1.96	1.07 to 3.62	*	
Men				
Living alone 69	1.78	1.02 to 3.11	1.76	0.60 to 5.21
Children living at home 69	1.94	1.03 to 3.68	1.44	0.52 to 3.94
<i>Cross sectional data in 1993</i>				
Women				
Children living at home 93	1.94	1.12 to 3.37	2.13	0.93 to 4.88
No time for oneself 93	2.05	1.15 to 3.68	1.85	0.76 to 4.51
Time pressure at work 93	2.11	1.22 to 3.64	2.31	0.89 to 5.99
High mental load at work 93	1.94	1.11 to 3.39	1.68	0.71 to 3.97
Psychological demands (index) 93	1.97	1.12 to 3.49	1.26	0.50 to 3.17
Men				
Living alone 93	1.85	1.01 to 3.40	2.41	0.79 to 7.29
High mental load at work 93	3.86	2.13 to 7.02	5.61	2.26 to 13.92
Lack of support at work (index) 93	2.61	1.48 to 4.61	2.03	0.70 to 6.20
(C) Outcome: heavy alcohol use				
<i>Longitudinal data, 1969–93</i>				
Women				
Overtime work 69	4.50	1.45 to 13.9	*	
Men				
Dissatisfaction with leisure activities 69	2.35	1.12 to 4.92	*	
<i>Cross sectional data in 1993</i>				
Women				
Regular smoker 93	3.13	1.20 to 8.16	3.51	1.13 to 10.90
Lack of job pride (index) 93	3.57	1.37 to 9.28	4.13	1.29 to 13.22
Men				
Regular smoker 93	3.08	1.59 to 5.97	*	

*Since only one statistically significant risk factor was found in the bivariate analysis, no multivariate analysis was performed.

**Only one of the two variables, Infrequent social contact 69 and Dissatisfaction with social contacts 69, has been used in each analysis since these variables were too highly correlated to be involved in the same multivariate analysis.

work related factors from 1969/70 were associated with depression in 1993/94 (table 3A).

Corresponding bivariate analyses for the outcome measure “depression in 1993/94”, including only those who had not had symptoms of depression in 1969/70, gave slightly different results. The risk estimates decreased by more than 0.5 for two factors for women and three for men, whereas the estimates increased for two factors for women and one for men. In one instance, this change meant that the lower confidence interval fell below 1.0: for men, frequency of social contacts in 1969/70 (RR = 2.57; 95% CI 0.44 to 15.0).

In the cross sectional, age adjusted, bivariate analyses among the factors examined in 1993/94 (table 3A), living alone was associated with “depression in 1993/94” for both women and men. In addition, lack of pride in one’s work

(index) was a risk factor for women, and high mental load at work was a risk factor for men. Having lots of contact with clients at work decreased the relative risk among women, and full time employment decreased the relative risk among men.

A cross sectional analysis of potential risk factors from 1969/70 in relation to the outcome measure “depression in 1969/70” showed that high mental load at work was significant for women. Corresponding analysis for men revealed infrequent social contacts, dissatisfaction with social contacts, and monotonous work as significant.

The multivariate analyses took up those risk factors that showed significance in bivariate analyses (table 3A). For the outcome measure “depression in 1993/94”, both the risk estimates in the longitudinal analyses (depression 1969, dissatisfaction with social contacts 1969), and both in the cross

sectional analyses in 1993/94 (living alone 1993, lack of job pride 1993) for women increased somewhat. For men, in the longitudinal data there was only one significant risk factor (infrequent social contact 1969) which kept the same, but in the cross sectional analysis in 1993/94, the risk estimates, high mental load at work 1993 and living alone 1993 increased slightly. In the corresponding multivariate analyses on cross sectional data in 1969/70, for men all three risk estimates were not significant, but the one estimate for women (high mental load at work 1969) remained the same.

GHQ 12

Bivariate analyses, adjusted for age, concerning longitudinal data of factors from 1969/70 in relation to the outcome measure "decreased psychological wellbeing in 1993/94", according to GHQ 12 (table 3B), showed that women who were dissatisfied with social contacts (RR = 1.96; 95% CI 1.07 to 3.62), and men who lived alone (RR = 1.78; 95% CI 1.02 to 3.11) or who had children in their home (RR = 1.94; 95% CI 1.03 to 3.68) were at heightened relative risk. In the cross sectional analyses among factors from 1993/94, the following were significant relative risks for women: having children in the home, not having time to oneself, time pressure at work, high mental load at work, and psychological demands at work (index). For men the significant relative risks in 1993/94 were living alone, having a high mental load at work, and lacking social support at work (index).

In the multivariate analysis on longitudinal data, one risk estimate for women (dissatisfaction with social contacts 1969) remained the same, and for men both risk estimates decreased and were not significant. In the corresponding cross sectional analysis all risk estimates changed somewhat for both women and men; one was still significant, namely having a high mental load at work in 1993/94 for men.

Heavy use of alcohol

In the bivariate analyses, adjusted for age, on longitudinal data significant associations were shown between the outcome measure "heavy use of alcohol in 1993/94" and overtime work in 1969/70 for women (RR = 4.50; 95% CI 1.45 to 13.9), and for men dissatisfaction with leisure time in 1969/70 (RR = 2.35; 95% CI 1.12 to 4.92). In the cross sectional analyses, for women, lack of job pride (index) in 1993/94 was associated with heavy use of alcohol in 1993/94, and for both sexes there was a strong association between habitual smoking in 1993/94 and heavy use of alcohol in 1993/94 (table 3C).

The multivariate analyses on longitudinal data were the same as the bivariate analyses above. In the cross sectional analyses the risk estimates increased slightly, and were still significant.

DISCUSSION

This study has focused on whether factors at work or in leisure time are associated with three different types of psychological symptoms: symptoms of depression, impaired psychological wellbeing according to GHQ 12, and heavy use of alcohol. The problem has been addressed with a longitudinal approach in a population based selection of subjects, and with a follow up time of 24 years. The same questions concerning exposure were used at both examinations, and at the follow up examination, additional questions about occupational exposure were asked. The subjects examined comprise a relatively narrow age range (42–58 years) of employed people, and the analysis has not revealed any possible age related effects.⁵

The results, from the multivariate analyses, in the longitudinal design showed that social networks and relationships were of great importance. Inadequacies in social contacts 24 years back in time constitute risk factors for depression: for women, the quality of social contacts was important, and for

men the quantity was important. In addition, previous symptoms of depression were a risk factor for depression in women.³⁶ Dissatisfaction with the quality of social contacts was also associated with an increased relative risk for impaired psychological wellbeing (GHQ 12) in women. Dissatisfaction with leisure activities was associated with heavy alcohol use in men, and working overtime was associated with heavy alcohol use in women.

All the factors associated with the three different types of psychological ill health in this longitudinal study design, can be said to be strongly coupled to social relationships: they describe a person's perception of his or her social relations, or pinpoint obstacles to social relationships. A factor that might be considered an obstacle to social relationships is frequently working overtime. Only this factor is directly related to work.

When the data were used as a cross sectional study with exposure and outcome at the beginning of the study and then as another cross section at follow up (supplemented with additional questions on exposure at work), certain work related exposures emerged as associated with psychological ill health. In the multivariate analyses this was still true of work related factors such as high mental load at work, and lack of job pride.

The results from the cross sectional data partially supported previous studies where psychological demands at work emerged as a risk factor.^{12–18} This is particularly true of studies having used the demand-control model.^{18–19} The model has proven reliable in relation to outcomes such as cardiovascular disease and musculoskeletal disease.^{19–20} In these instances, social support at work has been described as having a protective effect.²¹ However, that model was developed for studies of working conditions, and does not include circumstances outside working hours, whereas in this study, leisure time was also taken into account. In this study another work related aspect, namely lack of job pride, was added. This aspect turned out to be associated with psychological ill health.

A longitudinal study design has advantages, especially when the exposures are based on experiential data that are put in relation to symptoms of various kinds of psychological ill health. In a cross sectional study there is a risk that the person being interviewed confuses and overestimates exposures and symptoms, and thus also overestimates a potential association. This is particularly true of self reported data. In this study, the interval between reports of exposure and symptoms was 24 years. The demand-control model, though frequently used, was not wholly applicable for interpreting the outcome in terms of psychological ill health in this longitudinal examination. The importance of unsatisfactory leisure time social networks and relationships in the development of psychological ill health emerged here. Deficiencies in these social aspects—qualitative in the case of women, and quantitative for men—show up as risk factors, and can possibly be seen as explanatory variables. This corresponds with previous studies of the importance of social networks.²²

The fact that this longitudinal study does not identify working conditions as risk factors for psychological ill health may be due to several different circumstances. As mentioned above, the person interviewed may be confused about exposure and effect, and this can give false positive outcomes in cross sectional (but not longitudinal) studies. The study's time frame, with follow up 24 years after the first examination, may have been too long. The subjects examined here may well have held several different types of jobs and encountered a variety of psychosocial conditions where their individual weaknesses and work related problems have been compensated by better conditions. The workforce has changed during the time period covered in the study, mainly through a decreased proportion of subjects employed within the manufacturing industry, and this trend can also be seen in the study group. Seventy eight per cent of the women and 77% of the men reported that they had changed work at least once between 1969/70 and 1993/94. When examining occupational codes, 72% of both genders had changed

their occupational codes. Most of the subjects had changed occupation from manual work to administration. In some of the work related variables a high proportion of the subjects were exposed at both examinations (full time employment and hectic work); in other variables the proportion was low (monotonous work and poor social support from superiors). The subjects may have grown and developed, or they may have freed themselves from adverse working conditions. Another possible explanation was that the variables used at the first examination were too general or too imprecisely defined to reveal the psychological demands of a job. However, if the definitions of exposure variables were too general, this would not lead to overestimation of the risks.

Missing subjects, in the longitudinal design, is a well known problem that will increase with a long time period between the repeated examinations. In this study 16% were non-respondents at the first examination in 1969/70. Compared to the participants the agreement between the groups, in 1969/70, was good concerning their socioeconomic status and sick leave.²⁶ In the re-examination in 1993/94, 60% of those who fulfilled the inclusion criteria participated. The fairly high ratio of dropouts should be considered in the interpretation of the results of this study. However, in an analysis of the missing subjects, few differences were found between participants and dropouts in 1993/94. The dropouts had lower educational level and lower income. More female dropouts than participants had monotonous work, and fewer had overtime work in 1969/70. The study group in 1993/94 closely resembled the corresponding age group in the general urban population with regard to socioeconomic status and level of education,²⁹ variables that are well associated with occupation and thus are related to work related exposure.

Evaluation of psychological symptoms at follow up was done in three different ways: through self estimation of psychological wellbeing (GHQ 12), through estimation of alcohol consumption, and through interviews concerning symptoms of depression according to the criteria set forth in DSM-III-R. The three different outcome measures pick up slightly different categories among the subjects examined (with the best correlation between GHQ 12 and symptoms of depression) and thus enhance and refine our impression of different types of psychological ill health that may be associated with different conditions at work and in leisure time.

A greater proportion of women than men suffered from depression, and signs of depression in the first examination was a significant risk factor for women but not for men, in agreement with previous studies.³⁶ The proportion of men who were heavy consumers of alcohol was higher than for women, an observation that also agrees with previous studies.

Conclusions

Inadequacies in social networks—whether in terms of perceptions of social relations, or of practical obstacles to social relations—can be viewed as risk factors for depression in both men and women. There is a need for further studies concerning the different types of interpersonal relationships an individual participates in both at work and at leisure, and how these interact, to identify risk factors for psychological ill health.

The strength of the longitudinal study design emerges clearly when the outcome measure is psychological ill health. It is also of relevance to have several outcome measures for psychological ill health. Working conditions such as levels of demand and control do not appear sufficient to explain the outcome psychological ill health; additional data are required, such as data on work pride, social networks, and relationships in and out of working hours.

APPENDIX 1

In the 1969/70 study, data concerning psychosocial variables at work and leisure time were collected by a questionnaire

based interview. All answers are on a dichotomous scale and an affirmative answer to a question is most often synonymous with exposure. In those cases where a negative answer is synonymous with exposure, the questions are marked with an asterisk (or has parentheses at the end of the sentence). Answers on a dichotomous scale for nine work related exposure variables were grouped into seven types of exposures:

- (1) Full/part time work: Do you work full time (35–40 hours per week)?
- (2) Night or shift work: What are your working hours? (exposure = working shift or working nights).
- (3) Working overtime: Do you work overtime more than one hour per week?
- (4) High mental load: Is your work mentally demanding? and Do you often feel mentally exhausted in the afternoons after work?
- (5) Monotonous work: Is your work monotonous?
- (6) Hectic work: Is your work hectic?
- (7) Poor social support at work: *Is it possible for you to discuss work related problems with your closest superior? or *If it is, is your opinion taken into consideration?

Six exposure variables concerning non-working hours, also on a dichotomous scale, were grouped into five types of exposures:

- (8) No time for leisure time activities: *Do you have any time outside work when you can relax and do activities that you want to do?
- (9) Not satisfied with leisure time: *Are you satisfied with your leisure time?
- (10) Few social contacts: How often do you have contact with your friends or relatives? (exposure = when the subject once a month, or more rarely, has contact with friends or relatives)
- (11) Not satisfied with social contacts: *Are you satisfied with that contact?
- (12) Responsible for home and children: Gainfully employed as well as responsible for the children and the household: Do you have two jobs? (both paid work and unpaid work at home?) and Do you have children under 18 years of age living at home?

Socioeconomic groups were determined on the basis of the subject's occupation in 1969/70 and were roughly divided into white or blue collar worker groups.

APPENDIX 2

At the re-examination, a questionnaire concerning psychosocial variables at work and in leisure time in 1993/94 was answered by the study subjects. The same questions about working conditions from 1969/70 (Appendix 1, exposures 1–7) were repeated now as a questionnaire and focused on the conditions in 1993/94 together with the following questions. For the new variables the answering alternatives, and levels where the variables were dichotomised and considered as harmful, are given below.

- (1) Time pressure: Do you have so much time pressure at work that you find it hard to manage to do your work tasks? Four alternative answers, from never to almost always (exposure = often or almost always).
- (2) Excessive demands on skills: If there are formal demands of professional knowledge in your work, how well do they agree with your own education? Five alternatives from Demands are much higher than my own education to Demands are much lower than my own education (exposure = demands are higher or much higher than my own education).

(3) Low demands on skills: the same question as (2) above, but analysed according to low demands on education (exposure = demands are lower or much lower than my own education).

(4) Few possibilities to learn new things: Do you need to gain new knowledge now and then to manage your work tasks in a good way? Four alternatives from very much to not at all (exposure = to a little degree or not at all).

(5) Frequent contacts with clients: Have you in your work contacts with persons that are not employed at your workplace, such as customers, clients, passengers, students? Five alternatives, from almost the whole day to not at all (exposure = almost the whole day).

(6) Psychological demands (index on five questions): Does your work demand that you work very fast? Does your work demand that you work very hard? Does your work demand too great effort? Do you have time enough to do your work tasks? Are there any contradictory demands in your work? Four alternatives from almost never to very often. The index was dichotomised at the 75th centile.

(7) Authority over decisions (index on two questions): Do you have the possibility to influence how your work should be done? Do you have the possibility to influence what work shall be done? Four alternatives from almost never to very often. The index was dichotomised at the 75th centile.

(8) Skill discretion at work (index on four questions): Can you learn new things at work? Does your work require skills? Does your work require creativity? Do you have to do the same task over and over again? Four alternatives from almost never to very often. The index was dichotomised at the 75th centile.

(9) Social support at work (index on six questions): It is a calm and comfortable emotional climate at my work. The unity is good at my work. My colleagues support me. It is possible to have a bad day. I get on well with my superiors. I like my colleagues. Four alternatives from agree totally to not agree at all. The index was dichotomised at the 75th centile.

(10) Lack of job pride (index of four questions): Are your current work tasks stimulating? Do you feel safe and confident in your work? Do you think your work is valuable? Do you think that your work is valued by others? Four alternatives from not at all to very much. The index was dichotomised at the 75th centile.

Two variables about exposure during non-working hours, also on a dichotomous scale:

(11) No time for leisure time activities: How much time outside work do you have on an ordinary working day, when you can relax and do activities that you want to do? Five alternatives from more than six hours per day to less than one hour per day (exposure = less than one hour per day).

(12) Few social contacts (index on four questions): How often do you meet and spend time together with: (a) neighbours, (b) colleagues, (c) relatives, (d) friends? Six alternatives from almost never to several times a week (exposure = once per month or less on all four questions).

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