Self-reported treatment, workplace-oriented rehabilitation, change of occupation and subsequent sickness absence and disability pension among employees long-term sick-listed for psychiatric disorders: a prospective cohort study

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ABSTRACT

Aim: To examine whether self-reported treatments, workplace-oriented rehabilitation and change of occupation were associated with subsequent sickness absence and disability pension among long-term sick-listed for psychiatric disorders.

Design: A prospective cohort study.

Setting and participants: 5200 employees (80% from the Swedish municipalities and county councils and 20% manual workers from the Swedish industry) were randomly selected who in 1999 in the register of AFA Insurance had a new spell of long-term sickness absence due to a psychiatric disorder. Of these, 99 were excluded (duplicates and deaths, persons living abroad, with protected personal information), and 5101 received a questionnaire in 2001. 3053 individuals responded (60%). After the exclusion of employees with no sick leave in 1999 according to the Swedish social insurance agency, aged 62 years and older, with disability pension 1999–2001, no self-reported treatment, and with missing information on the covariates, our final study group was 2324 individuals. Logistic regression analyses were performed.

Outcome measures: Sickness absence (>90 days) and disability pension (>0 day).

Results: 45% had sickness absence and 18% a new disability pension in 2002. Drug treatment and physiotherapy, respectively, were associated with increased odds of sickness absence (OR 1.56, 95% CI 1.28 to 1.90; OR 1.43, 95% CI 1.21 to 1.69), and disability pension (OR 1.79, 95% CI 1.34 to 2.41; OR 1.75, 95% CI 1.40 to 2.18). Workplace-oriented rehabilitation and change of occupation, respectively, reduced the odds of sickness absence (OR 0.70, 95% CI 0.59 to 0.83; OR 0.35, 95% CI 0.27 to 0.45).

Conclusions: We found a pattern of poorer outcome of drug treatment and physiotherapy compared with other treatments (psychotherapy, workplace-oriented rehabilitation and complementary or alternative

ARTICLE SUMMARY

Article focus

- To examine whether self-reported treatment, workplace-oriented rehabilitation and/or change of occupation, might be associated with subsequent sickness absence and disability pension among employees long-term sick-listed for non-psychotic psychiatric disorders.

Key messages

- Drug treatment and physiotherapy increased the odds of subsequent sickness absence and newly granted disability pension compared with other treatments (psychotherapy, workplace-oriented rehabilitation and complementary or alternative medicine).
- Workplace-oriented rehabilitation and/or change of occupation reduced the odds of sickness absence and disability pension.

Strengths and limitation of this study

- This was a large prospective study of employees from both the private sector and the public sector.
- The register-based information on sick leave is an advantage.
- The study is restricted to those employees who reported sickness absence to AFA Insurance.

medicine) in terms of increased odds of sickness absence and disability pension. Workplace-oriented rehabilitation and/or change of occupation were associated with reduced odds of sick leave. Studies with a randomised controlled trial design are needed to examine the effect on sick leave of a workplace-oriented intervention.

BACKGROUND

Long-term sickness absence due to psychiatric disorders increased rapidly from the late 1990s until the first years of the 21st century in Sweden,^{1 2} as well as in other Western European countries.³ Between 1999 and 2009 the proportion of psychiatric disorders (mainly depression, anxiety disorders and stress-related psychiatric disorders such as severe burnout or exhaustion disorder⁴ among all long-term sick-listed increased from 18% to 27% in Sweden.²

Sickness absence due to psychiatric disorders is a strong predictor of disability pension (eg, see refs 5 and 6). Kivimäki *et al*⁶ found that the risk for disability pension was increased 14.1 times after long-term sickness absence for psychiatric disorders, as compared with a 5.7 times increased risk of disability pension after long-term sick-listing for musculoskeletal disorders. A Swedish study by Vaez *et al*⁷ on employees long-term sick-listed for psychiatric disorders in 1999 showed an increase in the mean number of sickness absence days from 17 days in 1996 to 211 days in 2000. During 2001 and 2002, there was a decrease in days of sickness absence, but the days on disability pension increased dramatically. In the present study we analysed associations of self-reported treatments and rehabilitation with sickness absence and disability pension in the cohort reported by Vaez *et al*.

There is strong scientific evidence that antidepressants and psychotherapy are effective for *symptom reduction* in depression and anxiety disorder (eg, see refs 8 and 9). In a review Nieuwenhuijsen *et al*¹⁰ found, however, no effect of medication, alone or combined with psychological interventions, on sickness absence, among workers who were depressed. Other studies^{11–17} on psychological interventions (eg, cognitive-behavioural therapy), counselling and stress-management interventions, physical activity training and relaxation suggest marginal or no effect on sick leave or return to work for patients with psychiatric disorders.

Some studies^{18–22} suggested more favourable outcomes in terms of return to work when the intervention is workplace oriented. Workplace-oriented rehabilitation might facilitate return to work and reduce sick leave in different ways. For example, the work ability may not improve as quickly as the core symptoms of depression.²³ If the employee returns to work with reduced symptoms of depression, but lowered work ability, a new adjustment of the job through workplace-oriented rehabilitation might be needed. Additionally, work-related stress and burnout might from the beginning be a consequence of a long-term mismatch between the person's abilities and the work characteristics.²⁰ If this mismatch remains unchanged after return to work the symptoms of, for example, stress-induced exhaustion may again evolve and perhaps lead to a relapse in sickness absence. If a match is not possible, the individual may need to change occupation. Previous studies have examined (temporary) changes in work tasks as a part of the intervention (eg, see ref 18), but there is a limited evidence

on the association of having changed occupation with sickness absence after psychiatric sick leave.

The aim of this study was to examine whether self-reported treatment, workplace-oriented rehabilitation and/or change of occupation, were associated with subsequent sickness absence and disability pension among employees long-term sick-listed for non-psychotic psychiatric disorders.

METHODS

Swedish social insurance system

In Sweden, all employed (and unemployed) persons can receive social insurance benefits during sickness absence or disability pension (full, three-quarter, half or one-quarter) from the Swedish social insurance agency (SSIA) if their work ability is reduced for medical reasons. The decision on benefit is taken by the SSIA. During the study period there was no upper time-limit for sick-leave benefit in Sweden. One waiting day of sickness absence and a 14–28 days employer payment period was introduced in the 1990s which implies that shorter periods of sick leave were not registered by the SSIA.^{1 24} Disability pension could be granted if the work ability was permanently reduced with at least one-quarter. A temporary disability pension could be received if the work ability was expected to be reduced during a considerable time. The criteria for full-time disability pension was 'having an entirely or almost entirely absent work ability'.^{24–26}

During the study period the employer was responsible for carrying out a rehabilitation investigation, after 4 weeks of sick-listing or repeated short-term absence. The employee could request a rehabilitation investigation. SSIA had the responsibility of coordinating rehabilitation between different actors (the employer, healthcare providers, etc). The employer was responsible for taking actions within the own workplace. Workplace-oriented rehabilitation includes, for example, adjustments of work to reduced work ability or job training.^{1 24 27}

In addition to the national insurance, most employees in Sweden are covered by an additional collective insurance. One of the largest collective group insurance schemes in Sweden is run by AFA Insurance which provides insurance above the statutory insurances to about three million persons. All municipal and county council employees, but also manual workers within the Swedish industry are covered by the insurance which is based on agreement between the parties on the labour market.²⁸

Material

This study was based on persons who lived in Sweden in 1999, were aged 20–65 years, and who according to the register of AFA Insurance had a new spell of long-term sickness absence (≥ 90 days) due to a psychiatric disorder (mainly depression, anxiety and stress-related disorders according to International Classification of Diseases-10). Psychoses, bipolar affective disorders and mental

disorders caused by psychoactive substance use were excluded. The sickness absence diagnosis derives from the sickness certificates made by physicians.²⁸ Of the subjects who fulfilled the inclusion criteria, 5200 individuals were randomly selected for the study (80% from the municipalities and county councils and 20% manual workers from the Swedish industry).⁷ Of these, 99 were excluded (duplicates and deaths, persons living abroad, with protected personal information). The remaining 5101 received a questionnaire in 2001.

In total, 3053 individuals answered the questionnaire in 2001 (60%). Of these, none had died before January 2003 according to the Swedish national cause of death register. Register data on sick leave for the years 1997–2002 from the SSIA were linked to these data. The register information contains total number of sickness absence and disability pension days per person and year. Sick leaves of part time were summed. Thus, for example, two 50% days of sickness absence were counted as 1 day.

Of the 3053 employees who answered the questionnaire, those were excluded whose sick leave spell had not, according to the register of the SSIA, begun in 1999. Employees aged 62 or above were also excluded due to a higher likelihood for old-age retirement, which precludes receipt of sickness absence and disability pension benefits. Additionally, since we wanted to compare different treatments with each other we only included those employees who reported having received at least one type of treatment. In order to analyse newly granted disability pension in 2002, we only included those employees with no disability pension during 1999–2001. Finally, we excluded those with missing values on the covariates and the final sample comprised 2324 individuals. Figure 1 shows the flow chart of the study.

Main background variables

Information on treatment was elicited with a question if the patient had received any of the following (yes or no):

Figure 1 Flow chart of the study. Reasons for exclusion: no sick leave in 1999 according the Swedish social insurance agency (n=43); employees in the ages 62 years and older at baseline (n=79); no self-reported treatment/rehabilitation (n=148); being granted disability pension 1999–2001 (n=295); missing information on the covariates (n=164).

drug treatment, psychotherapy, workplace-oriented rehabilitation, physiotherapy and complementary or alternative medicine (CAM). Treatment outcomes might differ if the sick-listed have received only one treatment compared with several treatments. Thus, in a first step we examined these treatments regardless if the patient had received any additional treatment. In a second step we examined patients who had only received one treatment. In a third step we examined four of the most common combinations of treatments. All these variables were dichotomised where those who reported having received the specific treatment/treatment combination, were compared with all other treatments/combinations (reference category). Finally, since workplace-oriented rehabilitation might be followed by a change of occupation, we compared individuals who received workplace-oriented rehabilitation and/or changed occupation, with those that had neither received workplace-oriented rehabilitation nor changed occupation (reference category).

Covariates

In this study we controlled for age, sex, socioeconomic status (SES), immigrant status, household situation and health measures in 1999 (baseline), as well as sickness absence in 1997/1998. Age was grouped into four categories: 20–34, 35–44, 45–54 and 55–61 years. SES-group was based on occupation and contained the following categories: high/intermediate non-manual employees (eg, physicians, dentists and teachers), assistant non-manual employees (eg, technicians, secretaries and nurses), skilled manual workers (such as guardians and assistant nurses) and unskilled manual workers (such as industry workers).⁷ Household situation was based on a question if the respondent at the time when they were on sick leave in 1999 were: living with an adult and no children, living with an adult and with children, living alone or living without partner and with children, and these four categories were used in this study. The variable on immigrant status was dichotomised and was based on a question if the respondents had immigrated to Sweden from another country or not.

In order to control for the possible influence of previous sick leave on the outcomes we adjusted for the presence/absence of sickness absence >14 registered days in 1997 or 1998 according to SSIA. Since associations of treatment with sickness absence and disability pension might differ depending on if the sick-listed suffered from depression, somatic illness, as well as comorbid somatic illness, we also adjusted for a combined variable on depression and/or somatic symptoms. Somatic symptoms derive from a question on what pains/symptoms the respondents had had at the time of sickness absence in 1999 with the following categories: Neck/shoulder/arm pains, low-back pain, joint problems, fibromyalgia, gastrointestinal/intestinal problems, heart trouble, asthma/allergy and other lung problems. People stating at least one of these symptoms were coded yes while others no. Questions of depression were based on DSM

IV, section A criteria for a major depressive episode.²⁹ Eleven questions covering symptoms of depression were used with five response alternatives for each question. The response alternatives were (1) applies exactly, (2) applies well, (3) applies more or less, (4) does not apply very well and (5) does not apply at all. Individuals who responded with alternative (1) or (2) to questions concerning depressed mood or loss of interest or pleasure, and responded with any of alternatives (1) or (2) to five or more of the 11 questions were classified as depressed. Finally, based on these two variables a combined measure was constructed with the four categories: not depression or somatic symptoms, depression but not somatic symptoms, depression and somatic symptoms and somatic symptoms but not depression. Since the results in the multivariate analyses were similar when missing values for the covariates were included as a separate category as in the analyses when omitting persons with missing values, the results are shown with missing values excluded.

Outcome variables

Sickness absence was measured as a dichotomised variable on having more than 90 days of sickness absence,

or not, in 2002. Disability pension was measured as a dichotomised variable on having disability pension (>0 day), or not, in 2002.

Statistical analysis

Univariate and multivariate analyses were performed by logistic regressions. The results are presented as ORs with 95% CIs for the associations between receipt of different treatments/rehabilitation and/or changed occupation, and the outcome sickness absence and disability pension, respectively. The partial likelihood test was applied to test significant interaction with sex, age and SES. Data were analysed by using the Statistical Package SPSS, V.20.0.

RESULTS

Descriptive statistics

Of the included individuals (n=2324), 83% were women (table 1). The largest age group was 45–54 years (40%), and the most common SES-group was assistant non-manual employees (43%). Eight per cent of the participants were immigrants, and 42% lived together with another adult and had children. Twenty-eight per cent

Table 1 Descriptive statistics of the participants at baseline (N=2324)

	Sickness absence*, >90 days 2002 n (%)	Disability pension*, >0 day 2002 n (%)
Sex		
Men (n=402)	169 (42.0)	83 (20.6)
Women (n=1922)	879 (45.7)	335 (17.4)
Age		
18–34 (n=300)	116 (38.7)	33 (11.0)
35–44 (n=702)	319 (45.4)	91 (13.0)
45–54 (n=941)	425 (45.2)	172 (18.3)
55–61 (n=381)	188 (49.3)	122 (32.0)
Immigrant		
No (n=2145)	960 (44.8)	370 (17.2)
Yes (n=179)	88 (49.2)	48 (26.8)
Socioeconomic status		
High/intermediate non manual employees (n=133)	53 (39.8)	18 (13.5)
Assistant non-manual employees (n=993)	456 (45.9)	179 (18.0)
Skilled manual workers (n=763)	349 (45.7)	129 (16.9)
Unskilled manual workers (n=435)	190 (43.7)	92 (21.1)
Household situation		
Living with adult and no children (n=653)	292 (44.7)	163 (25.0)
Living with adult and children (n=984)	423 (43.0)	123 (12.5)
Living alone (n=386)	194 (50.3)	82 (21.2)
Living without partner and with children (n=301)	139 (46.2)	50 (16.6)
Sick leave 1997/1998		
No (n=1680)	720 (42.9)	269 (16.0)
Yes (n=644)	328 (50.9)	149 (23.1)
Symptoms		
Not depression or somatic (n=276)	114 (41.3)	34 (12.3)
Depression but not somatic (n=973)	417 (42.9)	181 (18.6)
Depression and somatic (n=901)	441 (48.9)	168 (18.6)
Somatic not depression (n=174)	76 (43.7)	35 (20.1)

*Percentage of sickness absence and disability pension are counted horizontally on the variable categories.

had previous sickness absence (>14 days 1997/1998), and 42% reported symptoms of depression but not somatic symptoms in 1999. In all, 1048 individuals (45%) had sickness absence of more than 90 days in 2002, and 418 (18%) were granted a new disability pension in 2002. Overall, those individuals who were women, older, immigrants, in lower SES-groups, lived alone, had had previous sick leave and reported depression and somatic symptoms had more subsequent sickness absence. The same sociodemographic and health gradients could be seen for disability pension, except that men and those who lived with another adult and no children, as well as those who reported somatic symptoms but not depression were granted disability pension to the highest extent.

Treatment and sickness absence

Table 2 shows that drug treatment, physiotherapy and CAM were associated with significantly increased odds of

subsequent sickness absence, >90 days (crude model, OR ranging from 1.30 to 1.61). This result changed only marginally after adjustment for previous sick leave, age, sex, SES-group, immigrant status and household situation (model 2). After adjustments for previous sick leave as well as depression and/or somatic symptoms these results remained robust, although the OR for drug treatment reduced somewhat. Workplace-oriented rehabilitation was associated with reduced odds of sickness absence (model 3, OR 0.81, 95% CI 0.68 to 0.96). Having received psychotherapy only and workplace-oriented rehabilitation only, respectively, was associated with reduced odds of sickness absence (model 3). Table 2, fully adjusted model, shows higher odds of sickness absence for those who received the treatment combinations drug treatment, psychotherapy and physiotherapy (OR 1.67, 95% CI 1.25 to 2.25), compared with those who did not. The other treatment combinations were not significantly different to the reference group (table 2).

Table 2 OR and 95% CI for the association with sickness absence (>90 days, 2002) among employees on psychiatric long-term sick leave in 1999 who reported having received different treatments (1999–2001)

	Interval	Number of cases/individuals	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Drug treatment	No	213/585	1	1	1
	Yes	835/1739	1.61 (1.33 to 1.96)	1.62 (1.33 to 1.97)	1.56 (1.28 to 1.90)
Psychotherapy	No	315/725	1	1	1
	Yes	733/1599	1.10 (0.92 to 1.31)	1.15 (0.96 to 1.38)	1.16 (0.96 to 1.40)
Workplace-oriented rehabilitation	No	618/1301	1	1	1
	Yes	430/1023	0.80 (0.68 to 0.94)	0.81 (0.69 to 0.96)	0.81 (0.68 to 0.96)
Physiotherapy	No	542/1323	1	1	1
	Yes	506/1001	1.47 (1.25 to 1.74)	1.46 (1.23 to 1.73)	1.43 (1.21 to 1.69)
Complementary or alternative medicine	No	850/1932	1	1	1
	Yes	198/392	1.30 (1.04 to 1.61)	1.28 (1.03 to 1.60)	1.27 (1.02 to 1.59)
Only drug treatment	No	968/2134	1	1	1
	Yes	80/190	0.88 (0.65 to 1.18)	0.85 (0.63 to 1.15)	0.85 (0.63 to 1.15)
Only psychotherapy	No	1014/2213	1	1	1
	Yes	34/111	0.52 (0.35 to 0.79)	0.55 (0.36 to 0.83)	0.58 (0.38 to 0.87)
Only workplace-oriented rehabilitation	No	1038/2286	1	1	1
	Yes	10/38	0.43 (0.21 to 0.89)	0.40 (0.19 to 0.84)	0.45 (0.22 to 0.94)
Only physiotherapy	No	1035/2295	1	1	1
	Yes	13/29	0.99 (0.47 to 2.07)	0.97 (0.46 to 2.05)	0.93 (0.44 to 1.97)
Only complementary or alternative medicine	No	1042/2304	1	1	1
	Yes	6/20	0.52 (0.20 to 1.35)	0.49 (0.19 to 1.30)	0.51 (0.19 to 1.34)
Drug treatment and psychotherapy	No	915/2032	1	1	1
	Yes	133/292	1.02 (0.80 to 1.31)	1.02 (0.79 to 1.31)	1.03 (0.80 to 1.33)
Drug treatment, psychotherapy and workplace-oriented rehabilitation	No	947/2082	1	1	1
	Yes	101/242	0.86 (0.66 to 1.12)	0.89 (0.68 to 1.17)	0.88 (0.67 to 1.16)
Drug treatment, psychotherapy and physiotherapy	No	932/2120	1	1	1
	Yes	116/204	1.68 (1.26 to 2.25)	1.70 (1.27 to 2.27)	1.67 (1.25 to 2.25)
Drug treatment, psychotherapy, physiotherapy and workplace-oriented rehabilitation	No	970/2143	1	1	1
	Yes	78/181	0.92 (0.67 to 1.24)	0.93 (0.69 to 1.27)	0.91 (0.66 to 1.24)

The reference group comprises those not receiving the respective treatments. Model 1=crude OR with 95% CI. Model 2=OR with 95% CI adjusted for age, sex, socioeconomic status, immigrant status and household situation in 1999. Model 3=OR with 95% CI adjusted for the covariates in model 2, as well sickness absence 1997/1998 and somatic and depression symptoms in 1999.

Treatment and disability pension

There was a twofold increase in the odds of being granted a new disability pension after drug treatment, and the odds of subsequent disability pension was shown to be 80% higher among individuals who received physiotherapy, compared with those who did not (table 3, model 1). These ORs remained significant after adjustment for the covariates (model 3). Table 3 further shows that having received drug treatment only and psychotherapy only, respectively, was associated with reduced odds of disability pension (model 3). The result also shows increased odds of disability pension for those who received the treatment combinations: drug treatment, psychotherapy and physiotherapy (model 3, OR 1.55, 95% CI 1.09 to 2.20).

Additional analyses (results not reported) showed no significant interaction with sex and age. There was significant interaction with SES in the analyses of CAM with disability pension ($p=0.01$), and with SES in analyses of drug treatment only with sickness absence ($p=0.00$) in the fully adjusted models.

Workplace-oriented rehabilitation and/or change of occupation and sickness absence

Table 4 shows significantly reduced odds of subsequent sickness absence in the fully adjusted model for those employees who received workplace-oriented rehabilitation and/or changed occupation, compared with those who neither attended workplace-oriented rehabilitation nor changed occupation (OR ranging from 0.33 to 0.70). Change of occupation, as well as having received workplace-oriented rehabilitation and changed occupation, was associated with reduced odds of disability pension (model 3, OR 0.35; OR 0.43) (results not shown).

DISCUSSION

Main findings

The aim of this study was to examine if self-reported treatment, workplace-oriented rehabilitation and change of occupation were associated with sickness absence (>90 days) and newly granted disability pension among employees initially long-term sick-listed for psychiatric

Table 3 OR and 95% CI for the association with newly granted disability pension (2002) among employees on psychiatric long-term sick leave in 1999 who reported having received different treatments (1999–2001)

	Interval	Number of cases/individuals	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Drug treatment	No	65/585	1	1	1
	Yes	353/1739	2.04 (1.53 to 2.70)	1.91 (1.43 to 2.55)	1.79 (1.34 to 2.41)
Psychotherapy	No	137/725	1	1	1
	Yes	281/1599	0.91 (0.73 to 1.15)	1.13 (0.89 to 1.43)	1.11 (0.87 to 1.41)
Workplace-oriented rehabilitation	No	240/1301	1	1	1
	Yes	178/1023	0.93 (0.75 to 1.15)	1.01 (0.81 to 1.25)	1.02 (0.81 to 1.27)
Physiotherapy	No	190/1323	1	1	1
	Yes	228/1001	1.76 (1.42 to 2.18)	1.77 (1.42 to 2.21)	1.75 (1.40 to 2.18)
Complementary or alternative medicine	No	351/1932	1	1	1
	Yes	67/392	0.93 (0.70 to 1.24)	0.97 (0.72 to 1.31)	0.96 (0.71 to 1.30)
Only drug treatment	No	392/2134	1	1	1
	Yes	26/190	0.70 (0.46 to 1.08)	0.55 (0.35 to 0.85)	0.55 (0.35 to 0.86)
Only psychotherapy	No	410/2213	1	1	1
	Yes	8/111	0.34 (0.16 to 0.71)	0.41 (0.19 to 0.85)	0.44 (0.21 to 0.92)
Only physiotherapy	No	410/2295	1	1	1
	Yes	8/29	1.75 (0.77 to 3.98)	1.51 (0.64 to 3.55)	1.52 (0.64 to 3.62)
Drug treatment and psychotherapy	No	365/2032	1	1	1
	Yes	53/292	1.01 (0.74 to 1.39)	1.04 (0.75 to 1.44)	1.02 (0.73 to 1.42)
Drug treatment, psychotherapy and workplace-oriented rehabilitation	No	380/2082	1	1	1
	Yes	38/242	0.83 (0.58 to 1.20)	0.94 (0.64 to 1.36)	0.89 (0.61 to 1.29)
Drug treatment, psychotherapy and physiotherapy	No	368/2120	1	1	1
	Yes	50/204	1.55 (1.10 to 2.17)	1.57 (1.10 to 2.22)	1.52 (1.07 to 2.16)
Drug treatment, psychotherapy, physiotherapy, workplace-oriented rehabilitation	No	379/2143	1	1	1
	Yes	39/181	1.28 (0.88 to 1.85)	1.43 (0.98 to 2.10)	1.39 (0.95 to 2.05)

The reference group comprises those not receiving the respective treatments. Model 1=crude age, sex, socioeconomic status, immigrant status and household situation in 1999. Model 3=OR with 95% CI. Model 2=OR with 95% CI adjusted for the covariates in model 2, as well sickness absence 1997/1998 and somatic and depression symptoms in 1999.

Table 4 OR and 95% CI for the association with sickness absence (>90 days) among employees on psychiatric long-term sick leave in 1999 who reported having received workplace-oriented rehabilitation and/or changed occupation (1999–2001)

	N	Sickness absence			
		Cases	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Not workplace-oriented rehab or change of occupation	1088	560	1	1	1
Workplace-oriented rehabilitation	1023	430	0.68 (0.58 to 0.81)	0.70 (0.59 to 0.83)	0.70 (0.59 to 0.83)
Change of occupation	436	114	0.33 (0.26 to 0.43)	0.35 (0.27 to 0.45)	0.35 (0.27 to 0.45)
Workplace-oriented rehabilitation and change of occupation	223	56	0.32 (0.23 to 0.44)	0.33 (0.24 to 0.47)	0.33 (0.24 to 0.46)

The reference group comprises those not receiving workplace-oriented rehabilitation nor changed occupation. Model 1=crude OR with 95% CI. Model 2=OR with 95% CI adjusted for age, sex, socioeconomic status, immigrant status and household situation in 1999. Model 3=OR with 95% CI adjusted for the covariates in model 2, as well sickness absence 1997/1998 and somatic and depression symptoms in 1999.

disorders. We found a pattern of poorer outcome of drug treatment and physiotherapy compared with other treatments (psychotherapy, workplace-oriented rehabilitation and CAM). Workplace-oriented rehabilitation and/or change of occupation were associated with reduced odds of sickness absence and disability pension.

Methodology

In this large prospective study, employees representing occupations from the municipalities and county councils as well as the Swedish industry were included. A limitation is the restriction to those employees who reported sickness absence to AFA Insurance. The response rate in our study was relatively low (60%). In an analysis of a potential selection bias, we tested the proportion of employees with disability pension (>0 day) for the years 2000/2001 for those included in the study who answered the questionnaire, compared with those who did not. We found significantly higher levels of disability pension for the non-responders compared with the responders. This is in line with previous research³⁰ indicating poorer health of persons not participating in health studies.

The measures on treatments and change of occupation as well as most baseline-measures were self-reported, and might therefore be subject to recall bias. Moreover, we could not establish exactly when the treatments took place. Treatment might have different outcomes if it occurs early in a sick-leave spell, or after a longer period of time. In the analyses we only included individuals who reported having received at least one treatment. Among these respondents, for those who neither answered 'yes' or 'no' to the question if they had received a treatment, we assumed that they had not received the specific treatment. In the analyses of the associations of treatments with sickness absence and disability pension, those individuals who reported having received the specific treatment were compared with all others. This means that we could examine if there was a pattern of certain treatments being associated with poorer or more favourable outcomes. At the same time different reference groups were being used in these

analyses which might limit the possibility to compare the outcomes of the different treatments.

An advantage of our study is the use of register data on sick leave. Our outcome measure is the total number of days on sickness absence, and we do not know whether this represents one or several spells and if spells started before 2002. Every spell will however be longer than 14 days. In the analyses of sickness absence in 2002 as an outcome, individuals having been granted disability pension in 2002 were retained in the analyses. Additional analyses excluding individuals on disability pension in 2002 gave, however, the same overall pattern as the one reported here (not shown).

The outcome measure on disability pension has an advantage over sickness absence in methodological terms since we could examine treatment associations with newly granted disability pension. However, measuring sickness absence as an additional outcome to disability pension is interesting, as disability pension is mostly granted when regaining of workability is judged to be unlikely. Disability pension, sometimes combined with, for example, unemployment, is the most common way of leaving the workforce before normal old-age retirement (at the age of 65).²⁶

We found reduced odds of sick leave after a change of occupation. This association is likely to be influenced by selection, insofar that those with better health may be more likely to manage to change jobs. Still, in our analyses, we were able to adjust for self-reported health at baseline, as well as previous sickness absence. It is also likely that individuals in poor psychosocial quality jobs have the poorest health status and are least likely to change to a job with better working conditions.^{31 32} One might speculate that workplace-oriented rehabilitation could be associated with health selection insofar that persons with less severe conditions receive it to the highest extent, but it might also be the other way around. In additional analyses (results not reported), we have adjusted for variables reflecting negative changes in the psychosocial work environment (work load, time pressure at work, social support when needed, cooperation at the workplace, influence and control over one's

work, possibility to reconcile work and private life, feeling of participation in work and its content) during the last 6 months while working. These adjustments did not change the associations between workplace-oriented rehabilitation and change of occupation with sickness absence.

When comparing the treatments with each other we found an overall pattern of poorer outcome after drug treatment. This result was sustained also when we adjusted for self-reported depression and/or somatic symptoms at baseline. Our sample is psychiatric diagnostically heterogeneous and is likely to include both cases of major depression and cases where depressive symptoms are secondary to another condition, for example, stress induced exhaustion disorder.⁴ Trajectories and treatment associations are likely to differ between major depression and stress-induced exhaustion, but this diagnostic distinction can hardly be made on a questionnaire basis. Treatment with psychotropic drugs and psychotherapy is associated with the severity of disorder.^{33 34} As we did not have access to further information on psychiatric disorder severity, some unmeasured confounding is likely. The observed association of physiotherapy with an increased risk of sickness absence/disability pension was independent from self-reported somatic symptoms at baseline. As we did not have repeated measurements on comorbid somatic diseases, again, the likelihood of residual confounding cannot be completely disregarded.

The favourable sick leave outcome after workplace-oriented rehabilitation in our study is in line with previous experimental studies on return to work.^{18–20} However, the earlier-mentioned study by Blonk *et al*¹⁸ was based on self-employed persons, and in the study by van Oostrom *et al*¹⁹ the positive associations on return to work was limited to those employees who at baseline planned to return to work despite symptoms. These studies examined the associations on time to return to work in randomised controlled trials (RCT). In our study, we used register-based sick leave as outcome and assessed the associations of the type of treatment on psychiatric sickness absence in a large group of employees by questionnaires. In line with our study, Karlson *et al*²⁰ found an overall favourable outcome on return to work of a workplace-oriented intervention among public and private sector employees in a variety of professions. However, neither the study by Karlson *et al* nor our study was an RCT. Future studies with an RCT-design are needed to examine the association on sick leave of a workplace-oriented intervention.

In our study, change of occupation after psychiatric sickness absence was also associated with reduced odds of sick leave. This indicates that adjustments to the employee's work ability in terms of workplace-oriented rehabilitation or in a new job might reduce sick leave. These adjustments might lead to a greater feeling of self-control and efficacy for the individual which, in turn, might lead to a faster return to work.^{18 19} According to 90% of the respondents of this study the

psychiatric long-term sickness absence in 1999 was in some way associated with the job (results not reported). In additional analyses, the inclusion of this self-reported measure ('Do you think that your sickness period in 1999 had some association with your work?', categorised into: (1) no (2) yes and (3) do not know) in the fully adjusted model for the overall measures of treatment, workplace-oriented rehabilitation and change of occupation on the outcomes, only marginally change the results of our study (not reported).

CONCLUSIONS

In conclusion, we found a pattern of poorer outcome of drug treatment and physiotherapy compared with other treatments (psychotherapy, workplace-oriented rehabilitation and CAM) in terms of increased odds of subsequent sickness absence and newly granted disability pension among employees long-term sick-listed for psychiatric disorders. Workplace-oriented rehabilitation and/or change of occupation showed the most favourable outcome.

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