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ORIGINAL PAPER

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Mental disorders and employee sickness absence: the NEMESIS study

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Abstract *Background*: This study aimed to determine to what extent different forms of mental disorders are related to an increased likelihood of sickness absence and whether this increase depends on the employee's sex. *Methods*: Data of 3695 employed persons aged 18–64 years from a national sample of the Dutch population were derived from the first two waves of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). Mental disorders (DSM-III-R) in the past 12 months were assessed at baseline (1996). Subsequent sickness absence was assessed at the follow-up 1 year later. Somatic illnesses and age were included as controlled confounders. *Results*: Major depressive disorder, dysthymia, simple phobia and drug abuse/dependence were predictive of sickness absence in men. In women, the associations were weaker, and none of the 1-year DSM-III-R disorders was significantly related to the likelihood of sickness absence. *Conclusions*: Mental disorders are a more important risk factor for sickness absence for male employees than for female employees. Knowledge of this sex difference can be valuable for the development of interventions aiming at reducing sickness absence rates due to mental illness.

Introduction

There has been a great increase in sickness absence attributable to psychiatric morbidity over the past few decades (Stansfeld et al. 1995). Irrespective of whether this is a result of increasing prevalences of mental health problems, decreasing taboo on them or changes in the ways health and illness are defined, this indicates a need for new ways to prevent sickness absence. To be able to develop new prevention strategies aimed at decreasing the risk of sickness absence due to mental ill-health, we need insight into the disorder-specific mechanisms affecting the pathway from psychiatric morbidity to sickness absence. Understanding the relationship between mental disorders and sickness absence is an essential basis for this knowledge.

There are two approaches to assessing the relationship between psychiatric morbidity and sickness absence. The first one uses data from sick-leave records, including information on reason for absence, to distinguish psychiatric from non-psychiatric sickness absence. In the second one, psychiatric morbidity and sickness absence are assessed separately, and their relationship is determined by means of statistical methods.

Using the first approach, Stansfeld et al. (1995) found that minor psychiatric disorders were one of the most common reasons for sickness absence among the civil servants in London. They also reported an increase in the contribution of mental illness by increasing duration of absence spells. This was the case for both sexes. However, women were reported to be more often absent because of mental illness than men. This relationship held even after adjusting for the employment grade (Stansfeld et al. 1995). Similarly, several studies have reported a female preponderance in sickness absence for both mental and physical illness (Einerhand et al. 1995; North et al. 1993).

Hensing et al. (1995, 1996), using the same method, have shown that the sex difference in the incidence of psychiatric sickness absence is not as straightforward as it seems. The figures depend strongly on the degree of sex integration of the occupation: women have the highest incidence in the extremely male-dominated occupational groups and men in the extremely female-dominated occupational groups (Hensing et al. 1995). For both sexes, the incidence of psychiatric sickness

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absence was lowest in sex-integrated occupations. Another qualification for the female preponderance in psychiatric sickness absence is highlighted in the study by Hensing et al. (1996): although the incidence of sickness absence due to mental illness was higher for women, the duration of the psychiatric sick-leave spells was longer for men.

According to Stansfeld et al. (1995) and Hensing and Spak (1998), mental ill-health is under-reported in the sick-leave records because, in the health care system, it often either remains unrecognised or is covered-up with a somatic complaint. Stansfeld et al. (1995) conclude that the under-recognition and under-reporting has resulted in an underestimation of the impact of psychiatric morbidity as a cause of absence. This bias does not occur when sickness absence and psychiatric disorders are measured separately and their association is assessed by means of statistical analysis, as in the second approach.

This approach uses self-reports instead of sick-leave records to gather information on sickness absence. Information on mental disorders is usually based on the psychiatric diagnoses defined by one of the versions of the DSM (American Psychiatric Association). This makes it possible to take the diversity of psychiatric morbidity better into account by focusing on the different disorders next to the overall psychopathology. For example, in a study by Kessler and Frank (1997), the 1-month DSM-III-R disorders were cross-sectionally associated with a substantial number of work loss days and work cutback days. The association was strongest for major depression and the anxiety disorders. The effect of the disorders on work loss days was independent of the occupation.

The 6-month DSM-III-R disorders were strongly related to missing days from work/usual activities due to mental ill-health in a study by Kouzis and Eaton (1994). The strongest predictors of these 'disability days' were major depressive disorder and panic disorder. In their later study, the authors found that the likelihood of disability days due to mental or any other medical reason was highest for new cases of panic disorder and chronic cases of major depressive disorder (Kouzis and Eaton 1997).

Most of the previous studies did not examine whether the impact of mental disorders on sickness absence is modified by the employee's sex. Examination of a sex-specific variation is warranted in the light of the frequently reported sex differences in psychiatric morbidity (Bijl et al. 1998a; Kessler et al. 1994; Weissman and Klerman 1977) and help-seeking (Bijl and Ravelli 1999; Kessler et al. 1981; Leaf and Bruce 1987; Lin et al. 1996; Rhodes and Goering 1994). In a study of civil servants in the age group 20–35 years, Jenkins (1985) found a larger effect of minor psychiatric morbidity on sickness absence in men than in women. To our knowledge, no other studies have addressed the possible sex differences in the relationship between mental disorders and sickness absence.

The purpose of this study was to gain more insight into the association between mental disorders and sickness absence on the basis of a national general population sample of adult employed persons in the Netherlands. We expected the strength of the association to depend on the type of the disorder: mood disorders, especially major depression, and panic disorder were expected to be stronger predictors of sickness absence than the phobias or substance use disorders. We also expected the association of psychiatric disorders with sickness absence to vary by sex.

Subjects and methods

Sample and procedure

The data were derived from the Netherlands Mental Health Survey and Incidence Study (NEMESIS), a Dutch national general population study based on a stratified multistage random sample of non-institutionalised persons aged 18–64 years at baseline.

The population was stratified according to five degrees of urbanisation and an adequate dispersion across the 12 provinces of the country to guarantee optimal representativeness in the sample. In a three-stage random sampling procedure, municipalities within each stratum were selected randomly first, 90 municipalities in total. The second step was to draw a random sample of all private households (addresses) within each selected municipality from the post office registers. The number of households selected was proportional to the size of the municipality. In the third stage, one individual within each household was selected; the member with the most recent birthday. The inclusion criteria were the respondent's age (18–64) and sufficient mastery of the Dutch language. There was no oversampling of any specific groups.

The data were collected by means of computerised face-to-face interviews at respondents' homes. The analyses reported here were carried out on the data obtained at baseline (1996) and the first follow-up 1 year later (1997). The mean interval between the two occasions was 379 days (SD = 35). Informed consent was obtained from all respondents for both occasions. For a more detailed description of the sampling and fieldwork see Bijl et al. (1998b).

At baseline, 7147 persons were interviewed. This amounts to a response rate of 69.7% of the eligible persons. Usable data were obtained from 7076 respondents. The sample was representative of the entire population of the Netherlands with respect to sex, marital status, and degree of urbanisation of the place of residence, but the age group 18–24 years was under-represented (Bijl et al. 1998b).

At follow-up, 5618 persons were interviewed. This amounts to 79.4% of the baseline sample. Attrition between the baseline and follow-up was related to the employment status: respondents with paid employment were less likely to be lost to follow-up than respondents without paid employment (bivariate OR = 0.71; 95% CI = 0.63–0.81; $P < 0.001$).

Within the employed sample, subjects who remained in the study did not differ significantly from the lost ones with respect to sex (bivariate OR = 0.91; 95% CI = 0.79–1.06; $P = 0.220$) or age (mean: 38.75 vs 38.23; $t = 1.27$, $P = 0.205$). Attrition was not related to the occurrence of sickness absence in the 12-month period preceding the baseline interview either (bivariate OR = 1.00; 95% CI = 0.86–1.16; $P = 0.988$). With respect to the 1-year DSM-III-R disorders, there was a non-significant ($P > 0.05$) trend towards higher likelihood of being lost to follow-up related to the presence of the disorder. However, this relationship was significant only when all the DSM-III-R disorders were taken together; respondents with any 1-year DSM-III-R disorder were more likely to be lost to follow-up than were the respondents without any 1-year DSM-III-R disorder (bivariate OR = 1.30; 95% CI = 1.09–1.54; $P = 0.003$).

Information on the mental disorders was gathered at baseline. Information on sickness absence during the subsequent 12 months was gathered at follow-up. A total of 3764 respondents were

employed at the time of the follow-up interview. Information on sickness absence was missing from 69 of them, which means that the number of respondents in the analyses was 3695.

Instruments

Mental disorders

The Composite International Diagnostic Interview (CIDI), computerised version 1.1 (Smeets and Dingemans 1993), was used to obtain DSM-III-R diagnoses, axis I (American Psychiatric Association 1987). The CIDI is a fully structured diagnostic interview designed to be administered by well-trained interviewers who are not clinicians (Robins et al. 1988; World Health Organization 1990). A good interrater reliability, test-retest reliability and validity have been documented for all the diagnoses reported in this paper (Cottler et al. 1991; Farmer et al. 1991; Wittchen et al. 1991; Wittchen 1994).

In the analyses reported here, we used the information on the 12-month DSM-III-R diagnoses as measured at baseline. Each disorder was coded 0 if absent and 1 if present. The nine disorders considered in this study are: mood disorders (major depressive disorder and dysthymia), anxiety disorders (panic disorder, simple phobia, social phobia), and substance use disorders (alcohol abuse, alcohol dependence, drug abuse, drug dependence, including sedatives, hypnotics and anxiolytics). The small number of respondents with the remaining diagnoses measured in the NEMESIS precluded testing their association with sickness absence. However, the three main groups of disorders do contain them: apart from the disorders mentioned above, 'any mood disorder' contains bipolar disorder and 'any anxiety disorder' contains agoraphobia, obsessive-compulsive disorder, and generalized anxiety disorder.

Confounders

Several studies have reported comorbidity of psychiatric and somatic illnesses (Stansfeld et al. 1993). As somatic morbidity is also related to sickness absence, information on somatic illnesses needed to be included in the analyses to control for a potential confounding.

We used a checklist to obtain self-reports on 31 somatic illnesses and counted for each respondent the number of illnesses for which he or she had visited a doctor or received specialist treatment in the 12-month period prior to the interview. This resulted in a continuous variable with a theoretical range of 0–31. The illnesses ranged in severity from chronic hypertension to coronary heart disease. The list was derived from the Netherlands Health Interview Survey carried out by the Central Bureau of Statistics, and extended with three additional illnesses.

Apart from the somatic illnesses, we considered respondent's age as a possible confounder in the analyses, because it can also be related to both sickness absence (Stansfeld et al. 1995) and mental disorders (Bijl et al. 1998a; Kessler et al. 1994). If not controlled for, age would possibly bias the results regarding the contribution of the mental disorders to the likelihood of sickness absence.

Somatic illnesses and age were measured at baseline and analysed as continuous variables. We centred age but did not centre the somatic illnesses, since we considered the value 'no illnesses' as a meaningful reference value.

Sickness absence

In the follow-up interview, the respondents were asked whether or not they had been absent from work in the 12-month period prior to the interview. Sickness absence was coded 0 if absent and 1 if present. This dependent variable was predicted from the mental disorders assessed at the baseline. This design rules out the possibility that the sickness absence reported had occurred before the occurrence of psychopathology.

Data analysis

The data were analysed by means of logistic regression analysis using STATA 6.0 (StataCorp, 1999). Robust variance estimates were computed to take account of the clustering in the data resulting from the stratified sampling. Separate analyses were carried out on each mental disorder. Contribution of the disorder to the prediction of sickness absence was assessed after accounting for the confounders age and somatic illnesses. The analyses were stratified by sex to receive sex-specific odds ratio estimates for the disorders.

Results

Table 1 presents the distributions of sex, age, somatic illnesses and the 1-year DSM-III-R disorders in the sample. As in the entire population of employed persons in the Netherlands, there was a clear male preponderance in the sample. The most prevalent disorders were major depressive disorder, simple phobia, and alcohol abuse, followed by social phobia and alcohol dependence. From here on, drug abuse and drug dependence are reported together, since their prevalences were too low for separate analyses.

Sickness absence

A total of 1629 employed respondents reported at least one sickness absence spell in the 12-month period preceding the second interview. This amounts to 44.1% of the whole sample: 40.2% of the men and 49.0% of the women. Women were more likely than men to report at least one sickness absence spell (bivariate OR = 1.43; 95% CI = 1.26–1.64; $P < 0.001$). Age and somatic illnesses were also related to sickness absence. Compared to the respondents with no sickness absence, respondents with at least one sickness absence spell were slightly younger (mean age: 37.8 vs 38.7; $t = 2.747$; $P = 0.006$) and had more somatic illnesses (mean: 0.57 vs 0.45; $t = -4.315$; $P < 0.001$).

Figure 1 displays the percentage of respondents with at least one sickness absence spell separately for each 1-year DSM-III-R disorder, for the respondents without any DSM-III-R disorder and the respondents with at least one severe somatic illness. Drug abuse/dependence yielded the highest proportion of sickness absence (but the number of respondents with these disorders was low: 21 men and 9 women).

Among the respondents without any 1-year DSM-III-R disorder, the proportion of 1-year sickness absence was 10% higher in women than in men. Comparisons with these respondents reveal that, in general, the DSM disorders were related to a larger increase in sickness absence rates in men than in women. In dysthymia, simple phobia, social phobia and drug abuse/dependence, the absence rates were even higher for men than for women. In the remaining disorders as well as somatic illnesses, the female absence rates were either equal to or higher than the male ones. Surprisingly, women with social

Table 1 Sample distribution of sex, age, severe somatic illnesses and the 1-year DSM-III-R disorders (n = 3695)

	n	Percentage of the sample	(SE)
Sex			
Male	2064	55.9	
Female	1631	44.1	
DSM-III-R diagnosis			
Major depressive disorder	178	4.8	(0.4)
Dysthymia	55	1.5	(0.2)
Any mood disorder	224	6.1	(0.4)
Panic disorder	51	1.4	(0.2)
Social phobia	123	3.3	(0.3)
Simple phobia	208	5.6	(0.4)
Any anxiety disorder	364	9.9	(0.5)
Alcohol abuse	162	4.4	(0.3)
Alcohol dependence	124	3.4	(0.3)
Drug abuse	14	0.4	(0.1)
Drug dependence	17	0.5	(0.1)
Any substance use disorder	305	8.3	(0.5)
Any DSM-III-R disorder	740	20.0	(0.7)
Continuous variables			
Age			
Mean	38.27		
SD	9.93		
Range	18–64		
Severe somatic illnesses			
Mean	0.50		
SD	0.84		
Range	0–8		

phobia and women with alcohol dependence showed less sickness absence than women without any DSM disorder.

Multivariate logistic regression analyses of sickness absence

The contribution of the psychiatric disorders to the prediction of sickness absence was tested by means of logistic regression analyses. We analysed the eight DSM-III-R disorders and three groups of disorders separately. Age and somatic illnesses were included in the models to control for possible confounding.

Table 2 presents the results of the logistic regression analyses in terms of the sex-specific odds ratio estimates together with the 95% confidence intervals. In men, major depressive disorder, dysthymia, simple phobia and drug abuse/dependence were associated with an increased likelihood of sickness absence after

Fig. 1 Percentage of respondents with at least one sickness absence spell by 1-year DSM-III-R disorders and severe somatic illnesses

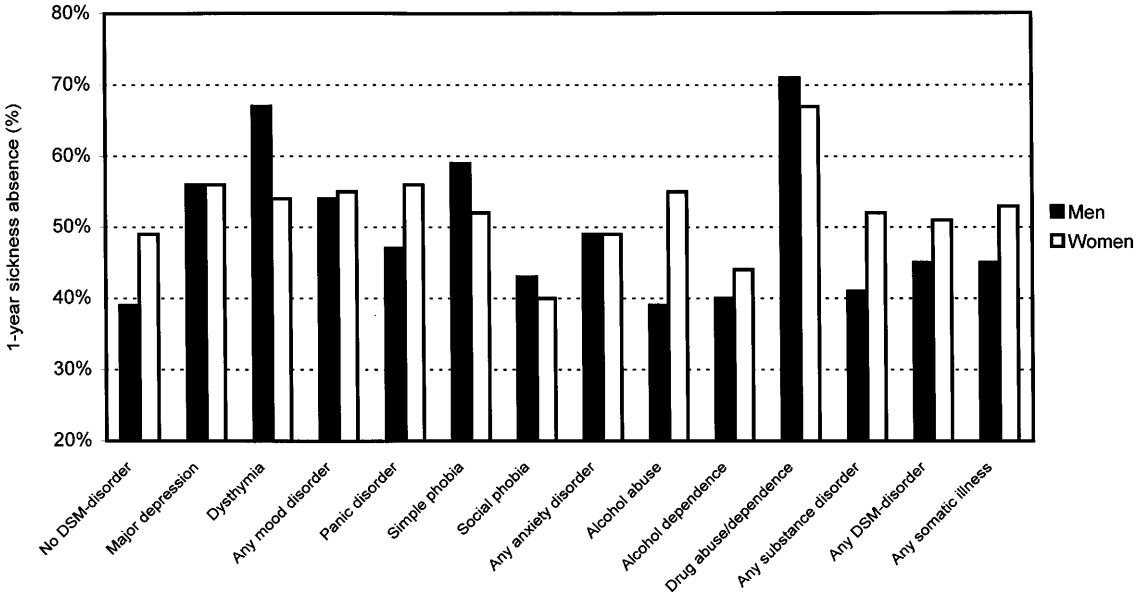

Table 2 The 1-year DSM-III-R disorders as predictors of subsequent sickness absence

DSM-III-R disorder	Men (n = 2064)		Women (n = 1631)	
	OR[a]	95% CI	OR[a]	95% CI
Mood disorders				
Major depressive disorder	1.87	1.23–2.82	1.29	0.80–2.08
Dysthymia	2.97	1.19–7.41	1.13	0.61–2.10
Any mood disorder	1.72	1.20–2.48	1.20	0.81–1.79
Anxiety disorders				
Panic disorder	1.25	0.49–3.19	1.22	0.61–2.41
Social phobia	1.05	0.65–1.69	0.64	0.37–1.09
Simple phobia	2.01	1.22–3.32	1.10	0.79–1.53
Any anxiety disorder	1.37	1.00–1.88	0.94	0.70–1.27
Substance use disorders				
Alcohol abuse	0.93	0.64–1.35	1.15	0.54–2.46
Alcohol dependence	0.97	0.64–1.47	0.74	0.26–2.14
Drug abuse/dependence	3.83	1.55–9.48	1.64	0.42–6.44
Any substance use disorder	1.00	0.78–1.29	1.00	0.60–1.65
Any DSM-III-R disorder	1.22	1.01–1.48	1.05	0.81–1.36

[a] OR: Odds ratio estimates adjusted for age and severe somatic illnesses

accounting for age and somatic illnesses. All mood disorders together predicted sickness absence as well. The increase in the likelihood of sickness absence was largest for drug abuse/dependence and dysthymia. These disorders were associated respectively with an almost fourfold and threefold increase in the likelihood of sickness absence in men. Major depressive disorder was associated with an 87% increase in the likelihood of absence and simple phobia with a twofold increase.

In women, none of the 1-year DSM-III-R disorders was associated with a significantly ($P < 0.05$) increased likelihood of sickness absence. Compared to men, all mood disorders and anxiety disorders showed a lower increase in sickness absence in women. Only alcohol abuse had a stronger association with sickness absence in women than in men. Drug abuse/dependence was associated with a 64% increase in sickness absence, but this increase was not statistically significant at the $P < 0.05$ level, probably because of the higher instability of the estimate caused by the small number of women with this disorder ($n = 9$).

Discussion

Various 1-year mental disorders as established by the DSM-III-R were examined in relation to sickness absence in the subsequent 12 months. Women showed higher sickness absence rates than men, but psychiatric morbidity was associated with a larger increase in sickness absence in men than in women. Of the DSM-III-R disorders, major depressive disorder, dysthymia, simple phobia and drug abuse/dependence had a significant ($P < 0.05$) association with an increased risk of sickness absence in men. These associations are not attributable to somatic complaints, since we controlled for them, as well as for age. For women, we did not find any significant associations between mental disorders and sickness absence.

Larger impact on men

The stronger relationship between mental disorders and sickness absence in men compared to women is consistent with the findings of Jenkins (1985). She reported that minor psychiatric morbidity had more effect on sickness absence in men than in women. A possible explanation for the smaller psychopathology-related increase in the risk of sickness absence for women is that an early detection and treatment of the mental health problems is more common in women, because they are more likely than men to seek professional help for their problems (Bijl and Ravelli 1999; Kessler et al. 1981; Leaf and Bruce 1987; Lin et al. 1996; Rhodes and Goering 1994). Receiving professional help at an early stage may help prevent sickness absence.

Higher levels of social support received from friends and colleagues may also account for a reduced risk of sickness absence (Stansfeld et al. 1997). Men may be less used to talking about their problems with others, and they presumably miss some of the social support that would prevent the problems from getting worse and help them to manage without taking absence from work. These and other possible explanations still need to be investigated to understand the underlying causes of the stronger association between psychopathology and sickness absence in men than women.

One should bear in mind that, with the exception of four diagnoses, we observed higher sickness absence rates for women irrespective of their diagnostic status. The female absence rate without psychopathology was 10% higher than the male one. As a result of a larger increase in the risk of sickness absence in men, the male absence rate approached the female one in many

disorders and even exceeded it in dysthymia, simple phobia, social phobia and drug abuse/dependence.

Alcohol

The negligible association of the alcohol-related disorders with sickness absence was unexpected. In previous general population studies, increased sickness absence has been related to alcohol abuse/dependence (Spak et al. 1998) as well as to frequent and heavy drinking (Jenkins 1986; Marmot et al. 1993). Different operationalizations of alcohol problems used in these studies probably contribute to this discrepancy in the results. It is also possible that in the Netherlands, colleagues and employers tolerate an employee with an alcohol problem to such an extent that no increased absence rates occur. As far as alcohol abuse is concerned, an association with sickness absence may also be negligible, because the abuse may be limited to weekends and holidays and, therefore, does not necessarily have any effect on the functioning of the person in the workplace. However, alcohol dependence does have serious work-related consequences by its contribution to poor work performance (Lisle 1994).

Limitations

The results of this study should be interpreted within the context of its limitations. First, we only had a global measure of sickness absence. Additional information on the length and frequency of the sickness absence spells might have revealed stronger associations, since the heterogeneity of our group of employees with sickness absence may have blurred a part of the association. A second limitation was the lack of a measure for subclinical depression. Mental health problems below the clinical level, such as minor depression, can be associated with a substantial degree of functional impairment (Broadhead et al. 1990). They probably also account for a part of sickness absence for mental ill-health.

Implications

Reduction of sickness absence is an important goal for both economic and medical reasons. Early detection and treatment have been shown to help minimise the costs of mental health problems in the workforce (Jenkins 1994). Potential ways to enhance an early detection and treatment are to provide information on the nature and treatment of mental health problems to the employees and to make occupational health services and specialised counselling available and easily accessible for everyone. It is possible that in many cases the employee is not aware of the psychological nature of their symptoms (e.g. sleeping problems in the case of depression) and, therefore, does not seek help, with the result that the problems become worse and they need to take absence from work. Colleagues and supervisors can play an important role in the early detection of the problems, because they are confronted with the symptoms frequently in the workplace.

Our findings indicate that in the interventions aiming at reducing sickness absence rates due to mental illness, special attention should be paid to male employees. For them, the psychopathology-related increase in the risk of sickness absence is larger than for female employees. In other words, mental disorders are a more important risk factor for sickness absence in male than in female employees. This finding provides valuable information for clinical practitioners in the occupational health services, general health care and specialised mental health care. Awareness of this sex difference may even help find new ways to prevent sickness absence in the case of mental disorders. However, to reach this goal we need more insight into the underlying factors of this difference between male and female employees.

We hope that the results of this study will contribute to the development of new ways to reduce sickness absence related to psychiatric morbidity.

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