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ORIGINAL ARTICLE

Mental health problems and the presentation of minor illnesses: Data from a 30-year follow-up in general practice

TIM OLDE HARTMAN, ERIC VAN RIJSWIJK, HISKE VAN RAVESTEIJN, LIEKE HASSINK-FRANKE, HANS BOR, EVELYN VAN WEEL-BAUMGARTEN & PETER LUCASSEN

Department of General Practice, Radboud University Nijmegen Medical Centre, Nijmegen, the Netherlands

Abstract

Background: Somatic comorbidity in patients with depression and anxiety is very prevalent and mainly studied with respect to chronic conditions. Patients with mental health problems are high utilizers of medical care. This may be a result of their functional impairment and illness behaviour, but also of their interpretation of common symptoms and their attitude towards healthcare. Therefore, we expect that patients with mental health problems are more likely to present with minor illnesses to the general practitioner. *Objective:* To assess the association of minor illnesses with depression and anxiety. *Methods:* A historic cohort study in a general practice database of 13 500 patients, with more than 30 years' follow-up. Three prevalent categories of minor illnesses were assessed: skin, musculoskeletal, and respiratory disorders. We studied the number of patients with a diagnosis of a minor illness in patients with depression and anxiety disorder compared with their matched controls. *Results:* We found 799 patients with depression and 153 patients with anxiety disorder. More patients with depression present skin, musculoskeletal, and respiratory disorders in the year before and the years following the initial diagnosis of depression. Depression appeared to be statistically significantly associated with presenting all three types of minor illnesses. More patients with anxiety disorder present skin and respiratory disorders in the year before diagnosis, and more musculoskeletal disorders in the years following the diagnosis of anxiety disorder. Anxiety disorder appeared to be statistically significantly associated with presenting skin and musculoskeletal morbidity.

Conclusion: Compared to controls, more patients with depression and anxiety disorder present minor illnesses. This could be due to their high attendance rate, altered illness behaviour, or to factors—e.g., stress—underlying both the development of depression or anxiety and the susceptibility to diseases.

Key words: *Depression, anxiety disorders, comorbidity, minor illness, illness, behaviour, coping*

Cases

Ms W contacts her general practitioner (GP) due to rhino sinusitis, which has been bothering her for about 3 days. In her medical history, an anxiety disorder is mentioned.

Mr D consults his GP for muscle pain in both arms, which has been present for 5 days. He was diagnosed with a major depression 8 years ago.

Most patients with symptoms of rhino sinusitis or muscle pain do not tend to consult their GP immediately. For most patients, rhino sinusitis and muscle pain are minor illnesses. Are patients with a history of depression or anxiety disorder more likely to consult for minor illnesses?

Introduction

General practitioners (GPs) take care of their patients over a long period of time for a broad variety of medical conditions, varying from rhino sinusitis and backache to chronic diseases such as diabetes mellitus and chronic obstructive pulmonary disease (COPD). GPs care for patients with a wide range of diseases and illnesses, and all kinds of combinations of diseases (i.e., comorbidity) (1).

Correspondence: T. C. Olde Hartman, Department of Family Medicine, Radboud University Nijmegen Medical Centre, PO Box 9101, 6500 HB Nijmegen, the Netherlands. Tel: +31 24 3615313. Fax: +31 24 3541862. E-mail: t.oldehartman@hag.umcn.nl

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Because of their perspective as a generalist, GPs consider themselves to be specialists in comorbidity.

Patterns of comorbidity of depression and anxiety disorders have been studied extensively, mainly related to other psychiatric disorders (2–7). Patients with a depressive disorder and patients with anxiety have high distress levels and higher rates of other psychiatric disorders (4,8,9).

Somatic comorbidity of patients with depression has also been studied extensively, but studies are almost always restricted to cardiovascular disorders and chronic pain conditions (10,11). There are only a few studies on somatic comorbidity in patients with anxiety disorders. Byrne et al. reported a similar prevalence of chronic medical conditions in patients with and without anxiety disorders (4). However, self-limiting minor illnesses have not been studied within this framework. Furthermore, most studies on comorbidity have a cross-sectional design and are performed in specialized medical care (4,6).

Patients with depression and anxiety disorders are high utilizers of medical care (4,8,12,13). Their high healthcare utilization may reflect their level of functional impairment and is related to their illness behaviour (8,14). Their interpretation of common symptoms and their attitude towards healthcare are likely to contribute to this high utilization of healthcare (6).

As a result of this high attendance rate and illness behaviour, we hypothesize that patients with depression and anxiety disorders are more likely to present with minor illnesses. Therefore, our aim was to study the association of depression and/or anxiety disorders with minor illnesses within a 30-year time frame.

Methods

We performed a historic cohort study in a general practice database of about 13 500 patients, representative of the general Dutch population with regard to age and gender, in order to assess the risk of a first episode of presenting minor illnesses in patients with depression or anxiety disorder.

Continuous Morbidity Registration database

We used data from the Continuous Morbidity Registration (CMR) Nijmegen database, a project of the Department of Family Medicine of the University of Nijmegen in the Netherlands (15–18). The database comprises a network of four practices in the Nijmegen region that has recorded all morbidity on an ongoing basis since 1971. In the Dutch healthcare system, the general practitioner has a defined list of patients and is the gatekeeper of

access to specialist medical care. Long-term data are available for nearly all patients, including diagnoses after referral (16). Every episode of illness is registered according to the E-list (19) and the International Classification of Health Problems in Primary Care (ICHPPC-2) (20). In addition to medical data, the following information is also available: age, sex, socio-economic status (SES) (low, middle, and high), and marital status. Over many years, monthly meetings for all GPs involved are held to discuss classification problems, to monitor the application of diagnostic criteria, and to discuss coding problems of hypothetical case histories.

Selection of patients

We selected three groups of patients from the CMR database.

Patients with depression. All patients classified with a code for depressive illness between 1971 and 2000 were selected from the CMR database ($n = 799$). Patients younger than 18 years at the time of their initial diagnosis of depression were excluded. Patients with a diagnosis of anxiety disorder prior to the diagnosis of depression were included in the group of patients with anxiety disorder.

Patients with anxiety disorder. We selected patients diagnosed with an anxiety disorder between 1971 and 2000 ($n = 153$). Patients younger than 18 years at the time of the first diagnosis of anxiety disorder were excluded. Patients with a diagnosis of depression prior to the diagnosis of anxiety disorder were included in the group of patients with depression. The code for anxiety disorder also includes panic disorder and phobia.

Control group. The control group was selected from all remaining patients. By using propensity-score matching, a control for each patient with depression or anxiety disorder was drawn from this group (21). For each control subject, a dummy "date of diagnosis" was used to equal the date of diagnosis of the patients with their matched controls (22). Controls therefore had to be present in the CMR database at the time of the diagnosis of depression or anxiety disorder of the matched patient. This dummy "date of diagnosis" marked the start of the observation period for the controls. Patients and controls were matched for age, sex, SES, practice site, and date of diagnosis.

Follow-up of patients with depression and anxiety disorder started on the date of diagnosis of the first episode of depression or anxiety disorder. Follow-up ended on the date the patient left the CMR database or at the end of the study (January 2000). These data were censored.

Minor illnesses

Data on minor illnesses were collected over the period of 1 year prior to the diagnosis until the end of the study. For minor illnesses, we assessed three prevalent categories: skin, musculoskeletal, and respiratory disorders (23). Skin disorders included infections of the skin, other diseases of the skin, nails, and hair. Minor illnesses of the musculoskeletal system included myalgia, low-back pain, bursitis, and tennis elbow. Respiratory disorders included, among others, common cold, tonsillitis, and upper-airway symptoms.

It should be mentioned that we did not study the frequency of presentation of the minor illnesses but the numbers of patients with a diagnosis of a minor illness within the time frame.

Statistical methods

Our analyses primarily involved comparing patients with depression with their matched controls and comparing patients with anxiety disorder with their matched controls. Statistical analyses were conducted using SAS.

In our propensity-score matching procedure, we first used a logistic regression model to predict the propensity of having depression or anxiety disorder, using individual characteristics such as age, sex, SES, practice site, and date of diagnosis. After balancing covariates in the propensity-score model, a matching algorithm was used with a 1:1 matching from best to next best for the outcome model. Best matches were defined as those with the highest digit match (0.00001) on the propensity score (22). The algorithm proceeded sequentially to the lower digit

match. The lowest allowable digit match was 0.1. To test whether the matching procedure resulted in comparable groups, the chi-square test and Student's t test were used. All p values are two-tailed.

Descriptive statistics were calculated for the minor illnesses 1 year prior to the diagnoses. The chi-square test was used for testing differences in occurrence of minor illnesses between patients and controls. Cox proportional hazard analysis was used to assess the risk of a first episode of minor illnesses in patients with depression or anxiety disorder compared to controls. Survival curves were drawn and hazard ratios (HR) are presented with 95% confidence intervals (CI). Survival curves were calculated for patients and controls for minor illnesses during the observation period after the diagnosis of depression or anxiety disorder. Patients with one of the three types of minor illnesses in the year before the diagnosis of depression or anxiety disorder were excluded from the (prospective) survival analysis because some of these minor illnesses can have a chronic or recurrent course. Risks differences of minor illnesses between patients and controls were adjusted for age, sex, socio-economic status, and practice site. We calculated the hazard ratios and the 95% CI. All p values are two-tailed, and p values of 0.05 or less were considered statistically significant.

Results

In the CMR database, we identified 799 patients with a depression disorder and 153 with an anxiety disorder. The mean duration of follow-up was 11.9 years in the patients with a depression and 8.9 years in the patients with an anxiety disorder. The characteristics of the patients of both groups and their controls are comparable (Table I). In Table II, morbidity is presented with respect to the minor illnesses of all patients in the year before the diagnosis of depression or anxiety disorder. Within this time frame, significantly more patients with depression or anxiety disorder compared to controls

Table I. Characteristics of patients with depression and anxiety disorder, and their controls.

	Patients with depression (*n* = 799)	Controls (*n* = 796)	Patients with anxiety disorder (*n* = 153)	Controls (*n* = 153)
Female, *n* (%)	529 (66.2)	534 (67.1)	102 (66.7)	102 (66.7)
Age, years (mean, SD)	45.9 (16.2)	45.7 (16.1)	39.6 (14.5)	39.4 (14.6)
Socio-economic status				
low, *n* (%)	370 (46.3)	370 (46.5)	66 (43.1)	66 (43.1)
middle, *n* (%)	339 (42.4)	349 (43.8)	62 (40.5)	63 (41.2)
high, *n* (%)	90 (11.3)	77 (9.7)	25 (16.3)	24 (15.7)
Duration of follow-up, years (mean, SD)	11.9 (9.8)	12.6 (9.9)	8.9 (7.2)	9.3 (6.0)

Table II. Skin, musculoskeletal, and respiratory morbidity in year before the diagnosis of depression or anxiety disorder.

	Patients with depression ($n = 799$)	Controls ($n = 796$)	Patients with anxiety disorder ($n = 153$)	Controls ($n = 153$)
Skin, n (%)	98 (12.3)**	63 (7.9)	24 (15.7)*	10 (6.5)
Musculoskeletal, n (%)	212 (26.5)**	152 (19.1)	39 (25.5)	31 (20.3)
Respiratory, n (%)	237 (29.7)**	180 (22.6)	42 (27.5)**	13 (8.5)

*$p < 0.05$, **$p < 0.01$.

presented with minor illnesses to the GP, the only exception being patients with musculoskeletal morbidity in patients with anxiety disorder. The prevalence of minor illnesses in the years following the initial diagnosis of depression and anxiety disorder shows that significantly more patients with depression than controls were diagnosed with skin, musculoskeletal, and respiratory morbidity (Table III). In patients with an anxiety disorder, we only found a significant association for musculoskeletal morbidity. We adjusted the association of depression and anxiety disorder with minor illnesses for age, sex, socio-economic status, and practice site (Table IV). A diagnosis of depression was statistically significantly associated with presenting skin, musculoskeletal, and respiratory morbidity. An anxiety disorder was statistically significantly associated with presenting skin and musculoskeletal morbidity, but not with presenting respiratory morbidity.

The proportions of patients presenting with a specific minor illness in a 1-, 5-, or 10-year time frame after diagnosis are presented in Table V. Within the whole time frame, we found that more patients with depression as well as more patients with anxiety, compared to their controls, presented minor illnesses to their GP. Even 10 years after the diagnosis of depression or anxiety disorders, these differences between patients and controls were evident.

Discussion

The results of this study provide new insights into the presentation of minor illnesses by patients with depressive and anxiety disorders. Compared to controls, more patients with depression present skin, musculoskeletal, and respiratory disorders in the year before and in the years following the initial

diagnosis of depression. A slightly different pattern of comorbidity is found in patients with anxiety: compared to controls, more patients present skin and respiratory disorders in the year before the initial diagnosis, and more patients present musculoskeletal disorders in the years after the diagnosis of anxiety disorder. These differences between patients and their controls persist even 10 years after the diagnosis of depression or anxiety disorder. Furthermore, depression is associated with presenting all three types of minor illnesses during study, whereas anxiety disorder is only associated with presenting skin and musculoskeletal morbidity.

The strength of this study is the long follow-up period. For some patients, this was even as long as 30 years. Moreover, we did not study prevalence in the population but patients presenting their problems to the general practitioner. Therefore, the symptoms were apparently relevant enough for the patient to consult their GP and for the GP to register them separately from the diagnosis of depression or anxiety disorder. The data of the presented morbidity are a reflection of daily practice and have a demonstrated reliability and validity (17). This is important because most studies on depression and anxiety are based on questionnaires or diagnostic interviews in which recall bias and patients' misinterpretation of questions appear (24,25).

One of the limitations of the study is inter-doctor variation in the diagnosis of depression or anxiety. We assume this to be small because criteria for diagnosis are discussed in monthly meetings, where the application of diagnostic criteria is monitored (15,16). However, neither "over-registration" nor "under-registration" can be ruled out. We used the propensity-score matching procedure to match patients and controls. However, this method only reduces bias in

Table III. Skin, musculoskeletal, and respiratory morbidity in years after the diagnosis of depression or anxiety disorder.

	Patients with depression	Controls	Patients with anxiety disorder	Controls
Skin, n (%)	377 (53.8)**	337 (46.0)	68 (52.7)	64 (44.8)
Musculoskeletal, n (%)	411 (70.0)*	414 (64.3)	76 (66.7)*	65 (53.3)
Respiratory, n (%)	369 (65.7)**	363 (58.9)	58 (52.3)	68 (58.6)

* $p < 0.05$, ** $p < 0.01$.

Table IV. Results of Cox proportional hazard analysis: hazard of minor illnesses (skin, musculoskeletal, and respiratory) in years after the diagnosis of depression or anxiety disorder.

Minor illnesses	Hazard ratio	95% CI	*P* value
Patients with depression			
Skin	1.40	1.21–1.63	<0.0001
Musculoskeletal	1.30	1.14–1.50	<0.001
Respiratory	1.47	1.27–1.71	<0.0001
Patients with anxiety disorder			
Skin	1.54	1.09–2.19	<0.05
Musculoskeletal	1.96	1.39–2.76	<0.0001
Respiratory	1.22	0.84–1.75	NS

Hazards for diagnosis of minor illnesses are adjusted for the year of diagnosis, gender, age, practice site, and socio-economic status. CI: confidence interval; NS: not significant.

certain patient characteristics (year of diagnosis, gender, age, practice site, and SES) (26). It is worth mentioning that we did not demonstrate a causal pathway between mental health problems and minor illnesses. We only describe a statistically significant association between them.

Several studies report on the number of somatic symptoms and prevalence rates of chronic diseases (e.g., diabetes and cardiovascular disorders) in patients with and without anxiety disorders (4,6). These studies report an association between clinical comorbidity and the specific condition of anxiety disorder. In patients with depression, high prevalence rates of pain-related medical problems are reported as well as

high prevalence rates of cardiovascular diseases (10,11,27). To the best of our knowledge, there are no studies reporting the prevalence of minor illness in patients with a depression or anxiety disorder.

Our findings of high rates of minor illnesses in patients with depression or anxiety can be explained by both patient-related and physician-related factors. Physicians might detect and register minor illnesses more easily, as patients with depressive or anxiety disorders attend their GP more often than controls. Why more patients with depression or anxiety disorder consult their GP for minor illnesses, however, is not clear. We hypothesize two mechanisms. Firstly, depression and anxiety are often associated with psychological distress (28). The symptoms associated with stress may lead to greater somatic awareness, to sensitization to symptoms, and, finally, to more stress-related symptoms, with help-seeking behaviour as a consequence (29,30). Secondly, there is increasing evidence of altered pathophysiological mechanisms in patients with mental health disorders. Physical and emotional stress results in an alteration of hormonal balance, especially in the hypothalamus-pituitary-adrenal (HPA) axis, and influences the immunological system (31). These hormonal and immunological processes might be an explanation for the vulnerability of these patients for a range of minor illnesses (such as infectious diseases) (6,31).

In conclusion, our analysis of the CMR database for the relationship of mental health disorders and the

Table V. Percentage of patients (95% confidence intervals) presenting a minor illness to their GP within 1, 5, or 10 years after the diagnoses of depression or anxiety disorder.

	Depression	Controls	Anxiety	Controls
1 year after diagnosis				
Skin	11.4 (9.0–13.8)	8.1 (6.1–10.1)	9.1 (4.0–14.2)	7.9 (3.4–12.4)
Musculoskeletal	20.8 (17.4–24.1)	18.0 (15.0–21.0)	18.6 (11.2–25.9)	10.1 (4.7–15.5)
Respiratory	24.1 (20.6–27.8)★	16.4 (13.5–19.4)	21.8 (13.9–29.6)	14.1 (8.2–20.0)
2 years after diagnosis				
Skin	21.2 (18.1–24.4)★	13.3 (10.8–15.9)	18.5 (11.3–25.7)	20.3 (13.4–27.2)
Musculoskeletal	37.3 (33.2–41.4)	34.2 (30.4–38.0)	38.2 (28.7–47.7)★	20.7 (13.3–28.1)
Respiratory	39.0 (34.7–43.2)★	28.7 (25.0–32.4)	34.1 (24.9–43.3)	23.5 (16.3–30.8)
5 years after diagnosis				
Skin	40.3 (36.3–44.2)★	29.6 (26.1–33.2)	49.0 (39.1–58.9)	36.0 (27.6–44.3)
Musculoskeletal	63.1 (58.7–67.4)	55.3 (51.1–59.5)	65.8 (55.8–75.8)★	44.6 (35.2–54.0)
Respiratory	61.6 (57.2–66.0)★	48.4 (44.2–52.7)	48.9 (38.6–59.2)	39.6 (31.1–48.1)
10 years after diagnosis				
Skin	59.7 (55.3–64.0)★	47.4 (43.1–51.5)	69.5 (58.7–80.3)	51.6 (41.9–61.3)
Musculoskeletal	82.4 (78.5–86.3)★	73.7 (69.5–77.9)	85.2 (75.6–94.7)★	59.2 (48.7–69.6)
Respiratory	75.8 (71.4–80.1)★	65.7 (61.2–70.2)	66.4 (54.1–78.8)	59.2 (48.7–69.7)

★Statistically significant.

presentation of minor illnesses over a 30-year time frame shows that depression and anxiety disorders are associated with the presentation of minor illnesses both in the year before the diagnosis of depression or anxiety as well as in the years after these diagnoses. The nature of the help-seeking behaviour, cognitive and emotional processes, or underlying stress in patients might account for the development of mental health disorders and susceptibility to diseases. The results of this first longitudinal study raise a number of interesting questions regarding the nature of the relationship between mental health problems and minor illnesses and its consequences for patients with a depression or anxiety disorder.

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