

Depression in men attending a rural general practice: factors associated with prevalence of depressive symptoms and diagnosis

CHRISTOPHER SHIELS, MARK GABBAY, CHRISTOPHER DOWRICK
and CHRISTOPHER HULBERT

Background Doctors are less likely to diagnose depression in men than in women. Little research has been conducted to explore the underlying reasons for this in rural settings, or to compare primary care doctors' and male patients' ratings of perceived depression.

Aims To identify symptomatic and socio-demographic correlates of depression in men attending a rural practice, and to compare and contrast general practitioners' and patients' assessments of depression.

Method All male patients of working age attending a rural general practice over a 12-month period were invited to participate.

Results Men reporting recent 'chest pain' or 'feeling tired/little energy', expressing low job enjoyment or with a previous diagnosis of depression were more likely to be scored above threshold on the Hospital Anxiety and Depression Scale – Depression sub-scale. There was little agreement between the doctors and their male patients about the degree of perceived depression.

Conclusions Educational interventions aimed at addressing the diagnosis of depression in men should take greater account of factors within a particular social setting.

Declaration of interest C.H. is a principal in the general practice in which the study took place.

It has been estimated that nearly a fifth of the UK population will experience depression at some time (Angst, 1997). Although up to three-quarters of those with severe symptoms may seek help from their general practitioner, there is evidence of underdiagnosis of this problem and non-evidence-based clinical management (Davidson & Meltzer-Brody, 1999; Anderson *et al*, 2000). Rates of diagnosed depression in men are lower than rates in women (Meltzer *et al*, 1995), but there has been little research investigating how living in rural or urban settings mediates the reporting of depression by men (Paykel *et al*, 2000; Ayuso-Mateos *et al*, 2001) or whether the particular social setting has specific risk factors for residents or influences how primary care doctors interpret and manage depression (Chew-Graham *et al*, 2002). Specific aims of this study were first, to identify significant symptomatic and socio-demographic correlates of depression in men attending a rural general practice, and second, to compare and contrast doctor and patient assessments of depression.

METHOD

Setting

The study was conducted at a general practice in a relatively prosperous rural area of Cheshire, with a mean registered patient Townsend social deprivation score (computed from registration addresses) of -3.2 . No patient scored higher than 0 on the Townsend index. The patient list at data collection commencement totalled 5272, including 1909 men of working age (16–65 years), two-thirds of all male patients registered with the practice. During the study period, three principals and an assistant general practitioner were working at the practice. The practice area meets recognised criteria for 'rurality' (not linked to a population centre $>15\,000$

and over 20% of its working population employed in agriculture, fisheries or forestry; Rousseau, 1995).

Study design

Following approval of the study by Chester District Ethics Committee, all male patients of working age attending a general practice appointment over a 12-month period (1997–1998) were approached to take part in the study. Those agreeing to participate were given an information sheet and a consent form, and issued with a baseline health and well-being questionnaire to complete before seeing the doctor. Each general practitioner seeing a study participant completed a separate assessment form following the index consultation. In addition, relevant data items were collected from the practice record.

Three forms were used to collect baseline data:

- The self-administered health and well-being questionnaire encompassed demographic details, the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) and a six-point Likert scale on which patients rated their perceived level of depression (higher scores indicated greater depression).
- The general practitioner's assessment form recorded the doctor's opinion of the patient's psychological state at the index consultation and included the same Likert depression scale used in the patient questionnaire.
- The patient data form was used to record information from the patient's practice notes relating to the number and types of consultations in the 12-month period before the index consultation, use of mental health services, hospital admissions, long-standing physical illnesses, previously diagnosed mental disorders, prescribed antidepressant medications and period of any certified sickness in the previous year.

The Hospital Anxiety and Depression Scale was initially developed as a tool for identifying cases of anxiety and depression among patients in non-psychiatric clinics (Zigmond & Snaith, 1983). Each sub-scale – one measuring anxiety (HADS-A) and the other depression (HADS-D) – contains seven items and has a maximum computed score of 24. A review of studies testing the validity of the HADS (Bjelland *et al*, 2002) confirmed that the optimisation

of sensitivity and specificity of both HADS-A and HADS-D for screening cases was achieved at a case cut-off score of 8 or more (as used in this study). The review concluded that the instrument performed well in screening for the separate dimensions of anxiety and depression 'in somatic, psychiatric and primary care patients, and in the general population' (Bjelland *et al*, 2002).

We investigated associations between HADS-D 'caseness' and both patient-reported variables (physical symptoms and socio-demographic factors) and secondary clinical data collected from patient records. We also compared the extent of agreement between doctor and patient Likert scale depression ratings, and between doctors' assessments and a caseness rating on the HADS-D. The validity of the doctor and patient assessments of depression in predicting HADS-D caseness was also tested.

Statistical analysis

For investigating differences between the groups of patients categorised as 'cases' and 'non-cases' on the basis of the HADS-D cut-off score, we applied univariate statistical tests. For continuous variables such as age, the independent samples *t*-test was used to test for significant differences between the two patient groups. For the dichotomous categorical variables

(e.g. symptom reported or not), we used the chi-squared test to detect any significant associations between the variable and HADS-D caseness. We constructed a logistic regression model in order to test for independent effects of patient factors upon risk of HADS-D caseness. Only significant factors from the univariate analysis stage were included as potential explanatory covariates in the regression model.

In order to allow meaningful comparison of doctors' and patients' assessments, ratings on the Likert depression scales were collapsed into dichotomous measures. A score above 2 (the mid-point on the scale) was assumed to indicate a degree of perceived depression. The technical justification for doing so was to construct 2 × 2 tables enabling calculation of simple unweighted kappa coefficients to express agreement between patient and doctor on the rating of depression. Also, the construction of such tables was a prerequisite for testing the validity of the dichotomous assessment measures in predicting HADS-D cases. For each measure, we report statistics relating to sensitivity, specificity, and positive and negative predictive tests.

Only patients consulting one of the three principal practice doctors or the assistant general practitioner were included in the analyses of agreement and validity. Patients seen by a locum doctor (*n*=179) were excluded from this part of the study. No statistically significant difference was

found between locum patients and the other patients in relation to age or HADS-D score.

Data were analysed using the Statistical Package for the Social Sciences, SPSS for Windows version 10.

RESULTS

Response rate

During the year of the study, 982 men of working age attended the surgery, of whom 92% (901 patients aged 20–64 years) consented to participate and completed the health and well-being questionnaire. Compared with the participants, patients who did not give consent were significantly older (mean age 49.5 *v.* 44.0 years; *t*=3.9, *d.f.*=980, *P*=0.001), more likely to have a chronic physical illness or handicap (30.9% *v.* 20.7%; $\chi^2=4.6$, *d.f.*=1, *P*=0.03) and to have had a period of sickness certification greater than 3 months in the previous year (17.3% *v.* 9.2%; $\chi^2=5.4$, *d.f.*=1, *P*=0.02). They were less likely to have a record of previous depression (11.1% *v.* 20.2%; $\chi^2=3.9$, *d.f.*=1, *P*=0.04).

Patient factors and HADS depression cases

In this study, depression cases were defined by a score of 8 or more on the HADS-D self-assessment scale. The prevalence rate

Table 1 Demographic characteristics of the study sample

Characteristic	All patients	HADS-D non-cases	HADS-D cases ¹	Significance
Age of patient, years: mean	44.0	44.1	43.9	<i>t</i> =0.13, <i>d.f.</i> =896, <i>P</i> =0.90
Number of consultations in previous 12 months: mean	2.3	2.0	2.4	<i>t</i> =1.39, <i>d.f.</i> =896, <i>P</i> =0.17
In paid work, %	86.3	87.5	78.9	$\chi^2=6.6$, <i>d.f.</i> =1, <i>P</i> =0.01
Works in agricultural sector, %	24.9	25.7	19.8	$\chi^2=1.6$, <i>d.f.</i> =1, <i>P</i> =0.21
Enjoys job most or all of time, %	82.1	86.2	54.6	$\chi^2=57.2$, <i>d.f.</i> =1, <i>P</i> =0.0001
Lives in rented property, %	20.4	18.9	27.8	$\chi^2=5.3$, <i>d.f.</i> =1, <i>P</i> =0.02
Lives alone, %	8.7	8.6	9.5	$\chi^2=0.10$, <i>d.f.</i> =1, <i>P</i> =0.74
Married/cohabiting, %	73.9	73.0	79.2	$\chi^2=2.1$, <i>d.f.</i> =1, <i>P</i> =0.14
Post-school study, %	60.0	60.2	59.2	$\chi^2=0.04$, <i>d.f.</i> =1, <i>P</i> =0.84
Claiming state benefits, %	12.7	10.5	25.6	$\chi^2=22.3$, <i>d.f.</i> =1, <i>P</i> =0.0001
History of clinical depression, %	20.2	17.7	34.9	$\chi^2=19.9$, <i>d.f.</i> =1, <i>P</i> =0.0001
Certified sick > 3 months in previous 12 months, %	9.2	7.8	17.5	$\chi^2=12.2$, <i>d.f.</i> =1, <i>P</i> =0.0001
Suffering serious physical illness/handicap, %	20.7	19.6	27.0	$\chi^2=3.6$, <i>d.f.</i> =1, <i>P</i> =0.06
Number of patients	901	772	126	

HADS-D, Hospital Anxiety and Depression Scale – Depression sub-scale.

1. Score 8 or over on the HADS-D.

*Note: HADS-D score could not be computed for 3 patients.

Table 2 Patients reporting physical symptoms in the 4 weeks before the index consultation

Symptom	HADS–D non-cases (n=772) %	HADS–D cases ¹ (n=126) %	Age-adjusted odds ratio OR (95% CI)
Stomach pain	18.2	33.1***	2.22 (1.46–3.38)
Back pain	44.0	52.0	1.38 (0.95–2.02)
Pain in limbs or joints	53.1	63.2*	1.53 (1.03–2.28)
Headaches	38.2	55.6***	2.06 (1.40–3.03)
Chest pain	15.4	38.1***	3.39 (2.25–5.11)
Dizziness	12.2	33.1***	3.58 (2.32–5.53)
Shortness of breath	22.2	43.9***	2.74 (1.85–4.07)
Bowel problems	17.4	30.1**	2.04 (1.33–3.13)
Nausea, wind or indigestion	33.7	48.4**	1.84 (1.26–2.70)
Sexual problems/pain	2.0	6.7**	3.62 (1.49–8.78)
Feeling tired/little energy	53.2	88.7***	7.08 (3.98–12.61)

HADS–D, Hospital Anxiety and Depression Scale – Depression sub-scale.

1. Score 8 or over on the HADS–D.

*P < 0.05, **P < 0.01, ***P < 0.001.

Table 3 Logistic regression of depression ‘caseness’ by reported physical symptoms and patient characteristics¹

Covariates	Odds ratio (95% CI)	P
Reported symptoms		
Stomach pain	1.11 (0.58–2.15)	0.74
Pain in limbs or joints	0.91 (0.55–1.52)	0.73
Headaches	0.94 (0.56–1.57)	0.80
Chest pain	2.04 (1.12–3.72)	0.02
Dizziness	1.74 (0.93–3.30)	0.08
Shortness of breath	1.07 (0.60–1.90)	0.83
Bowel problems	1.14 (0.59–2.21)	0.69
Nausea, wind or indigestion	0.98 (0.56–1.71)	0.94
Sexual problems/pain	2.27 (0.67–7.68)	0.19
Feeling tired/little energy	4.06 (2.01–8.20)	0.0001
Patient characteristics		
Little or no job enjoyment	3.85 (2.33–6.25)	0.0001
Housing tenure (rented)	1.37 (0.76–2.48)	0.30
Claiming state benefit	2.13 (0.89–5.06)	0.08
History of clinical depression	2.03 (1.15–3.56)	0.01
Certified sick for 3 months in previous 12 months	1.19 (0.41–3.46)	0.75

1. Dependent variable is caseness on the Hospital Anxiety and Depression Scale – Depression sub-scale, cut-off score 8 or over.

for depression identified by this criterion among participants was 14% (126/901).

Table 1 summarises the relationship between a range of patient factors and depression. Significantly fewer men with depression were in paid work compared with the rest of the sample; if in work, they were less likely to enjoy their job. They were also significantly more likely to live in rented accommodation, to be receiving state benefits, to have a history

of depression or to have been certified sick for more than 3 months in the year before the index consultation.

Physical symptom reporting and HADS–D caseness

Differences in specified physical symptoms reported in the 4 weeks before the index consultation in patients rated as depression cases and non-cases are presented in

Table 4 Agreement between doctor and patient assessments of depression using the Likert scale

	Participating doctor			
	1	2	3	4
Patients rated as depressed¹ (%)				
Self-rated	23.1	27.4	29.7	25.4
Rated by doctor	3.9	3.0	6.9	7.5
Kappa	0.19	0.11	0.12	0.18
All patients (n)	255	299	101	67

1. Depression defined as a rating above the mid-point of the six-point Likert scale.

Table 2. Men categorised as depressed were significantly more likely to report physical symptoms in all our defined categories except back pain. Associations between reported symptoms and depression were not significantly affected by patient age.

Independent effects of patient factors and symptoms

We conducted a logistic regression to explore independent associations between patient socio-demographic and clinical factors, reported physical symptoms and risk of depression (Table 3). All variables significantly associated with depression at the univariate level of analysis were initially included as covariates in the regression model. However, the ‘in paid work’ variable was constant across all selected cases, and was thus excluded.

After regression, only four covariates (two reported symptoms and two patient factors) retained a statistically significant association with depression. Men reporting chest pain in the previous 4 weeks were over twice as likely to be depressed as those not reporting this symptom. Men reporting being very tired or having no energy in the past month, men not enjoying their work and men with previous depression were also significantly more likely to be depressed.

Comparison of assessments of depression

Levels of agreement between doctor and patient assessments on the Likert depression scale as well as with the HADS–D-derived definition of caseness are shown in Tables 4 and 5. Only the 722 (80.1%) patients consulting one of the four general

Table 5 Agreement between doctor's assessment of depression on the Likert scale and caseness on the Hospital Anxiety and Depression Scale

	Participating doctor			
	1	2	3	4
Patients rated as depressed (%)				
Rated by doctor ¹	3.9	3.0	6.9	7.5
Rated by HADS-D score ²	10.9	15.7	16.8	13.4
Kappa	0.34	0.25	0.08	0.53
All patients (n)	256	299	101	67

HADS-D, Hospital Anxiety and Depression Scale – Depression sub-scale.

1. Depression defined as a rating above the mid-point of the six-point Likert scale.

2. Depression defined as a score of 8 or over on the HADS-D.

practitioners are included in the analysis. Although 26.4% of patients rated their level of depression above the mid-point on the Likert scale, only 5.3% of the doctors' assessments did so. This compares with a HADS-D defined prevalence of 14.2%. Agreement between the patients' and doctors' Likert depression ratings was poor, with a mean κ coefficient of 0.15. However, the doctors' Likert depression assessments were more congruent with HADS-D caseness (mean $\kappa=0.30$). Only one doctor failed to reach a fair to moderate level of agreement with the HADS ($\kappa=0.08$).

Table 6 presents data on the validity of the doctors' and patients' assessments of

depression, using HADS-D caseness as the predicted gold standard. The doctors' assessments (sensitivity 24.6%) were less accurate than patient ratings (sensitivity 75.5%) in identifying HADS-D cases.

DISCUSSION

The prevalence of depression (14%) in this study of men attending a rural general practice is higher than that recorded in previous studies reporting rates categorised by gender and social setting (Paykel *et al*, 2000; Ayuso-Mateos *et al*, 2001). However, previous studies were of the general population rather than primary care patients. Our choice of a diagnostic cut-off score of 8 or more on the HADS-D is validated to include both 'probable' and 'possible' cases of depression, set in favour of sensitivity rather than specificity. In unadjusted univariate analysis, a range of recently experienced physical symptoms were associated with depression. Two symptoms, chest pain and feeling tired or having no energy, retained this significant association after adjustment for other symptoms and socio-demographic and clinical variables. In terms of independent effects on depression, only one demographic or socio-economic patient factor, job enjoyment, was found to be statistically significant. We also found that previous depression was significantly associated with current caseness on the HADS-D. There were wide disparities between general practitioners' and patients' Likert scale ratings

of reported depression: patients were significantly more likely to consider themselves depressed than were their doctors. This divergence in rating depression was found both in terms of agreement between doctor and patient assessments (overall $\kappa=0.15$) and, to a lesser extent, between doctor-defined and HADS-D-defined cases ($\kappa=0.30$). The proportion of 'missed' HADS-D cases was higher for the general practitioners (doctor sensitivity 24.6% *v.* patient sensitivity 75.5%), although the former had fewer false positives overall (doctor specificity 97.4% *v.* patient specificity 81.7%).

Methodological limitations

Our sample was recruited over a complete year, and included over 90% of all potential participants. The practice area meets recognised criteria for rurality, although it cannot be assumed to be typical of all UK rural populations. The Likert depression rating was developed for this study and had not been previously validated. However, it is unlikely that the wide differences between doctor and patient ratings could be explained by the psychometric properties of the scale. We did not collect data on the characteristics of the general practitioners (e.g. demographics and attitudes) that might influence their rating of patient depression but there is no reason to assume that they differ from those of other clinicians working in comparable demographic settings. Although the men who declined to participate in the study differed from the sample in some respects, the only variable that might have biased our findings is the relatively lower proportion of non-participants with a previous episode of depression recorded in their notes. Men with depression may have a recall bias with regard to physical symptoms, being more likely to notice them and amplify their duration and severity (Katon, 2003), but any such bias adds strength to the argument that the presentation of these symptoms should be seen as a marker for possible depression.

Implications of our findings

Although the rate of rural male depression found in our study was higher than that found in other studies, previous research has consistently found lower rates of depression in rural areas compared with urban environments. The European Outcome of Depression International Network

Table 6 Predictive validity of dichotomous patient and doctor assessments¹

	Participating doctor				All doctors
	1	2	3	4	
Patient's assessment					
Sensitivity, %	71.4	74.5	76.5	77.8	75.5
Specificity, %	82.8	81.3	79.8	82.8	81.7
Positive predictive test, %	33.9	42.7	43.3	41.2	40.3
Negative predictive test, %	95.9	94.5	94.4	96.0	95.2
Doctor's assessment					
Sensitivity, %	25.0	17.0	11.8	44.4	24.6
Specificity, %	99.1	99.6	94.0	98.3	97.8
Positive predictive test, %	77.8	88.9	28.6	80.0	68.8
Negative predictive test, %	91.5	86.6	84.0	91.9	88.5
All patients (n)	256	299	101	67	722

1. Assumes caseness on the Hospital Anxiety and Depression – Depression sub-scale (score 8 or over) to be the predicted outcome.

(ODIN) study included samples from five urban and four rural centres in five countries, including the UK and Ireland, and collected data relating to prevalence of depressive disorder and associated risk factors; in the UK, prevalence of depressive disorder in the urban centre (17.1%) was substantially higher than that found in the rural study population (6.1%) (Ayuso-Mateos *et al*, 2001). The UK National Morbidity Survey reported significantly higher rates of psychiatric morbidity and of alcohol and drug dependence in urban compared with rural areas. After adjustment for a range of socio-demographic factors the effect of urban residence upon risk of psychiatric morbidity was considerably weakened, but was still statistically significant: OR=1.33, $P < 0.05$ (Paykel *et al*, 2000).

Our research suggests that the pattern of factors associated with depression among rural men may differ from those described for deprived urban populations. Employment status, housing tenure, type of work and family structure were not significant factors in predicting male depression in our study. However, for those in paid employment, lack of enjoyment in their work was a significant correlate of depression. Because our study was restricted to people of working age, no evidence is available concerning risk factors for depression in elderly men. Our finding of a significant link between low job enjoyment or satisfaction and depression is consistent with previous research exploring the attitudes of general practitioners to the interpretation and management of depression. A qualitative study of practice in different social settings in north-west England concluded that general practitioners in inner-city urban areas were more likely than their suburban and semi-rural counterparts to see depression as a product of social problems and to be largely intractable in nature. The semi-rural and suburban practitioners, treating less socially deprived patients in a more prosperous setting, were more prone to associate depression with purely work-related problems, and to consider it as largely treatable (Chew-Graham *et al*, 2002).

Perhaps our most striking findings relate to the differences between clinicians and patients in their immediate assessments of depression. Regardless of the analysis used (agreement or sensitivity) and the lack of previous validation of the rating scales, there was a clear disparity between the

two agencies. We have postulated in previous research that precise agreement between the patient and general practitioner on the nature of symptoms is possibly less important than both parties identifying depression as the core problem (Gabbay *et al*, 2003). Furthermore, poor sensitivity in general practitioners' detection of depression in cases defined by HADS score has been reported in other studies. Analysis of aggregated data from the Hampshire Depression Project found that nearly two-thirds of cases of depression (score > 7 on HADS-D) were missed by general practitioners using a four-point rating scale (Thompson *et al*, 2001). However, the study also reported that marked improvements in sensitivity were achieved by minor revisions in the HADS-D case threshold (Thompson *et al*, 2001).

Previous research suggests that 'psychological' symptom patterns may be categorised differently by health professionals and their patients (Leff, 1978). There is also evidence that patients tend to present physical symptoms before psychological ones (Burack & Carpenter, 1983) and that doctors tend to interrupt patients before they have completed their opening statements (Beckman & Frankel, 1984). These factors may explain the tendency to miss depression among patients using normalising symptom attributions (Kessler *et al*, 1999). The problems of underdetection of depression and suboptimal management of the condition when diagnosed, within general practice, have typically been addressed by educational interventions. This approach assumes that there are key skills that can be taught to primary care doctors in order to facilitate psychological symptom interpretation, more accurate diagnosis of depression and better management. However, results of intervention trials have been disappointing. A recent cluster randomised controlled trial of an educational intervention – training general practitioners in managing depression – found that patients treated by the intervention group had higher rates of satisfaction, but did not significantly differ from patients treated by the control group in terms of outcomes of depression (Gask *et al*, 2004). Educational initiatives have typically been based on methods of implementing clinical guidelines for the diagnosis and management of depression. One such randomised controlled trial, involving 60 primary care practices, developed a training intervention intended to support guideline

adherence throughout the study year. However, despite considerable resource input, no significant difference was found between trial arms in relation to either the detection of true positives or the short-term and longer-term patient outcomes (Thompson *et al*, 2000).

Guideline-based education may in the future prove to be effective in increasing detection rates and improving outcomes for patients with depression. However, such an impact would require considerable expansion of the evidence base supporting the guideline recommendations and the subsequent educational interventions (Kendrick, 2000). In particular, more empirical evidence is required that would allow greater insight into why patients with various characteristics, and in a particular social setting, have specific risk factors associated with depression, and how the risk is mediated by the diagnostic skills of the general practitioner. This may include considering both 'pre-consultation' factors, such as patient socio-demographic and occupational characteristics, and 'within-consultation' factors, such as doctors' different symptom attribution styles.

Improvements in identification and management of depression among men in rural communities will require more than general practitioner education alone. It is also important to ensure that relevant and effective resources to manage depression are available. Doctors are more likely to make a diagnosis of depression if they consider that they have sufficient skills and treatment options to manage it successfully (Dowrick *et al*, 2000). Since depression among rural men is relatively uncharted territory, it is possible that the doctors in this study were less likely to make a diagnosis because they were uncertain whether the limited range of treatment options available in primary care – antidepressant medication or counselling – would be acceptable to this group of patients.

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CLINICAL IMPLICATIONS

- Cases of depression are common among men attending a rural general practice.
- Depression is associated with specific physical symptoms and with low job satisfaction.
- Doctors are less likely than patients to diagnose depression in this group.

LIMITATIONS

- The Likert scale used for rating depression has not been fully validated.
- No data were collected relating to study general practitioner characteristics.
- There is a possibility of patient recall bias with regard to physical symptoms.

CHRISTOPHER SHIELS, MPhil, Mersey Primary Care R&D Consortium; MARK GABBAY, MD, CHRISTOPHER DOWRICK, MD, Department of Primary Care, University of Liverpool; CHRISTOPHER HULBERT, Laurel Bank Surgery, Malpas, Cheshire, UK

Correspondence: Mr C. Shiels, Department of Primary Care, Whelan Building, University of Liverpool, Liverpool L69 3GB, UK. E-mail: cs50@liv.ac.uk

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