Patient determinants of mental health interventions in primary care

R RAINE

L LEWIS

T SENSKY

A HUTCHINGS

S HIRSCH

N BLACK

SUMMARY

Background. *A large proportion of a general practitioner's (GP's) caseload comprises patients with mental health problems. It is important to ensure that care is provided appropriately, on the basis of clinical need. It is therefore necessary to investigate the determinants of the use of mental health care in the primary care sector and, in particular, to identify any non-clinical characteristics of patients that affect the likelihood of their receiving appropriate care.*

Aim. *To identify and compare the influence of non-clinical patient factors on GPs' acknowledgement of mental problems and on their provision of mental health care.*

Method. *Cross sectional study of adults aged 16 to 65 years old (n = 802) attending one of eight practices (20 GPs in total) in inner west London.*

Results. *Multivariable analysis showed that the combination of factors that best predict GPs' acknowledgement of the presence of mental problems are general health questionnaire (GHQ) scores (odds ratio [OR] = 1.10 per unit increase in score, 95% confidence interval [CI] = 1.07 to 1.13), previous mental symptoms (OR = 7.5, 95% CI = 4.3 to 12.9), increasing age (OR = 1.03 per one-year increase, 95% CI = 1.01 to 1.04) and physical health status (OR = 0.98 per unit increase in short form-36 (SF-36) score, 95% CI = 0.96 to 1.00). Multivariable analysis showed that the combination of factors that best predict intervention (prescription for psychotropic medication; return visit to GP; referral to psychiatric inpatients/outpatients; referral to other [specified] health professionals, or social services) are previous symptoms (OR = 7.4, 95% CI = 3.8 to 14.4), white ethnic group (OR = 2.2, 95% CI 0.9 to 5.5); and not owning a property (OR = 2.1, 95% CI = 1.1 to 4.0). Life events influenced intervention only in the presence of low GHQ scores (OR = 8.1, 95% CI = 2.7 to 24.0).*

Conclusions. *Mental problems are common in primary care and their acknowledgement is a necessary but not a sufficient condition for intervention. Our results show that GPs' decisions about mental health interventions can be influenced by non-clinical patient factors, regardless of patients' clinical needs. The results suggest that current practice may not always be equitable, and point to the need for better understanding of the basis of these potential inequalities and for focused training.*

Keywords: mental health; patient factors; intervention; primary care.

R Raine, BSc, MBBS, MSc, MFPHM, MRC/North Thames clinical lecturer in health services research; A Hutchings, BSc, MSc, CPFA, lecturer in health services research; and N Black, MD, FFPHM, DCH, professor of health services research, Health Services Research Unit, London School of Hygiene and Tropical Medicine, London. L Lewis, BSc, MSc, senior research associate; and S Hirsch, MD, FRCP, FRCPsych, professor of psychiatry, Department of Psychiatry, Imperial College of Science, Technology and Medicine, London. T Sensky, PhD, FRCPsych, reader in psychological medicine, Department of Public Mental Health, Imperial College of Science, Technology and Medicine, West Middlesex University Hospital, Isleworth, Middlesex.

Submitted: 22 February 1999; Editor's response: 29 January 2000; final acceptance: 24 March 2000.

Introduction

PATIENTS with mental problems constitute approximately one-third of general practice attenders.[1] Those who receive care are more likely to achieve a good outcome than those who do not.[1,2] It is therefore important to ensure that care is provided appropriately; that is, on the basis of clinical need. However, there is evidence that patients' social, demographic, and physical health characteristics affect both the general practitioner's (GP's) prescribing of psychotropic medications and their referral to specialist care.[3-14] Such patient characteristics may exert their influence in one or more of three ways: they may increase the risk or severity of mental illness, or affect the likelihood that the general practitioner will detect mental problems, or affect the decision to treat them (Figure 1).[2,15-23]

However, published studies on the determinants of the use of mental health care in the primary care sector have not distinguished between the effects of patient characteristics on GPs' acknowledgement of the presence of mental problems and their clinical judgement as to whether to treat or not. In addition, previous findings were not adjusted for differences in the patients' clinical severity[5,11,14] and the results of the earliest studies may be out of date, as some are over 20 years old.[3,9,10,12] The extent to which those results are relevant and generalisable to primary care today is therefore uncertain. The present study was designed to overcome these three limitations. It aimed to identify and compare the influence of non-clinical patient factors on GPs' acknowledgement of mental problems and their treatment decisions, having taken account of the clinical severity of the presenting mental state.

Method

Inclusion criteria

The study was carried out in west London as part of a wider research project involving practices without specialist mental health professionals available on site. Eight practices (comprising 20 principals in total) were recruited. The practices covered the catchment area of two health authorities. For each GP, 50 consecutive adult attenders were recruited. Patients were excluded if they were aged under 16 or over 65 years, or if their command of English was inadequate to complete the questionnaire unaided.

Procedure

Patient questionnaires. Prior to seeing the GP, each patient

recruited to the study completed the General Health Questionnaire-28 (GHQ-28)[24] and the Short Form-36 (SF-36).[25] The measurement properties of these instruments have been well established in the United Kingdom.[26-28] The GHQ is used to identify patients likely to have psychological problems, and who therefore may need health care. A score of five or above is suggestive of psychiatric risk.[23]. Physical and mental health summary scores were derived form the SF-36. Scores range from zero (representing the worst possible health state) to 100 (the best possible health state).[28] A further questionnaire designed for the project sought information from patients on their age, sex, ethnic group, marital, employment and housing status, and recent life events.

General practitioner questionnaire. The GPs completed a brief questionnaire about each patient immediately after the consultation, stating whether the patient was currently judged to have any mental problems and if an intervention was indicated. This questionnaire differed from one used in other studies[18] which asked GPs to rate their appraisal of the severity of psychiatric disturbance.[18,23] The GPs made these judgements without knowing the patient's GHQ score.

Information from general practice records. Interventions associated with the index consultation were extracted from patients' records one to two years later by two of the researchers (RR and MS). For the purposes of this study, a mental health care intervention was defined as one or more of the following: prescription of psychotropic medication; GP request that the patient return for a further consultation (for any reason); referral to psychiatric in/outpatients; referral to other mental health professionals or to social services. Mental symptoms recorded in the previous 12 months were also extracted.

Analysis

The dependent variables investigated were GP acknowledgement of the presence of mental problems (from the GPs' questionnaire) and intervention for such problems. Associations between each of these and the independent variables (sociodemographic characteristics, life events, SF-36 score, current mental health status as defined by GHQ score, and previous mental problems and treatment) were examined by calculating odds ratios and their 95% confidence intervals, adjusting for severity of mental symptoms using GHQ scores. Multiple variable logistic regression using SPSS version 8.0 was used to identify the factors that together best predicted acknowledgement of mental problems and clinical intervention.[29] After including the GHQ score, independent variables were added to the model one at a time, based on improvement in model fit using the likelihood ratio test. Less stringent criteria are recommended for adding variables to models and a significance level of $P<0.1$ was used for the inclusion of variables.[30] Both *P*-values and conventional 95% confidence intervals are reported in the analyses. Intuitively selected interactions between variables (GHQ score and known sociodemographic predictors of case acknowledgement) were tested within the models. Interaction terms were included in the model if the improvement in model fit was at the $P<0.1$ level.

Results

Recruitment

A total of 1035 patients (387 men and 648 women) were recruited (more than 50 patients were recruited by some GPs). Practice records were obtained for 802 (77.5%) patients. Three hundred and forty-five (25%) patients who were approached declined to participate in the study. Most of the 233 patients (83%) with missing records had moved away from the practice in the year or two since the index consultation. A comparison showed that those without records were younger (mean age 33.8 versus 37.4 years, $P<0.01$) and more likely to be single (51.9% versus 43.9%, $P = 0.03$), Black African (7.7% versus 3.3%, $P<0.01$) and private tenants (47.7% versus 33.5%, $P<0.01$). There were no statistically significant differences ($P<0.05$) between patients in terms of sex, employment status, GHQ score, SF-36 score, and GP acknowledgement of mental problems.

Patient characteristics and GP intervention

The sociodemographic and clinical characteristics of the sample are summarised in Table 1. Life events during the previous year, acknowledged by 29% of the sample, included moving house (9.4%), being pregnant (8.4% of female patients) and suffering a bereavement (5.2%). Almost half (49.4%) of the patients

Table 1. Demographic characteristics and health status of patients in whom intervention was measured (n = 802). Values are numbers (%) of patients unless otherwise stated.

Characteristic	Number (%)
Male sex	304 (37.9)
Mean age in years (standard deviation)	37.4 (12.8)
Ethnic group	
White	610 (77.0)
Black Caribbean	67 (8.5)
Black African	26 (3.3)
Pakistani	7 (0.9)
Indian	25 (3.2)
Bangladeshi	4 (0.5)
Chinese	3 (0.4)
Other	50 (6.3)
Missing	10
Employment status	
Employed/self employed	486 (63.6)
Unemployed	127 (16.6)
Retired	41 (5.4)
Other	110 (14.4)
Missing	38
Marital status	
Married/cohabiting	356 (44.7)
Single	350 (43.9)
Divorced	72 (9.0)
Widowed	19 (2.4)
Missing	5
Housing status	
Owner/occupier	323 (43.5)
Private tenant	249 (33.6)
Local authority	162 (21.8)
Homeless	8 (1.1)
Missing	60
Life events in previous 12 months	
Life events recorded	224 (29.3)
No life events recorded	568 (70.7)
Missing	10
GHQ mean score (standard deviation)	6.15 (6.09)
SF-36 mean summary scores (standard deviation)	
Mental component	43.11 (8.64)
Physical component	45.69 (8.83)
GP acknowledgement of mental problems	259 (32.3)
Mental problems recorded in GP records in previous 12 months	95 (11.8)

screened positive for mental problems on the GHQ (score of five or above). In their questionnaire responses, GPs recognised the presence of mental problems in 259 (32.3%) patients but judged that only 58 required an intervention. The most frequent interventions were psychotropic medication and a return appointment (Table 2). Only three patients (0.4%) were referred to mental health specialists.

Univariable analysis

Acknowledgement of mental problems. This was strongly associated with current GHQ score, or a history of mental problems, or of an intervention in the preceding 12 months (Table 3). These latter two factors continued to contribute to acknowledgement even after adjusting for GHQ score. The GPs were more likely to acknowledge mental problems in those who were unemployed, older, or in poorer physical health (assessed by SF-36 Physical Summary Score).

Mental health interventions. General practitioners' decisions to treat were also strongly associated with the presence of mental problems (Table 3): the higher the GHQ score, or if there was a history of mental problems or treatment for such problems, the more likely was the intervention. Again, after adjusting for GHQ score, the impact of each of these factors was reduced but remained statistically significant. After controlling for GHQ score the other factors that increased the likelihood of intervention were the occurrence of life events, better physical health, and not being a property owner. There was some evidence (P = 0.052) of an association between receiving an intervention and being white.

Multivariable analysis

Acknowledgement of mental problems. The best predictive model is shown in Table 4. GPs were more likely to recognise mental problems in the presence of increasing GHQ scores or a history of mental problems. They were also more likely to recognise mental problems in older patients (P<0.001) and in those in poorer physical health (P = 0.062).

Mental health interventions. Mental health interventions were more likely with a history of mental problems (P<0.001) (Table 4). Patients' ethnic group and housing status also exerted independent effects: white patients were more than twice as likely to receive health care than their non-white counterparts (P = 0.087), as were patients in rented accommodation or who are homeless (P = 0.034). The influence on intervention of GHQ score was modified by patients' recent life events. Including an interaction term between these two factors in the model led to a significant improvement in model fit (likelihood ratio test P = 0.035). Reported life events were associated with an eight-fold increase in the likelihood of intervention in healthy patients (GHQ scores

Table 2. Action taken by GP (n = 802). The total number of interventions is more than 58, as three patients received more than one intervention.

Mental health intervention by GP	Number (%)
Any intervention	58 (7.2)
Psychotropic medication prescribed	31 (3.9)
Return appointment	27 (3.4)
Referral to community mental health professionals	2 (0.2)
Referral to psychiatric outpatients	1 (0.1)
Referral to psychiatry inpatients	0
Referral to social services	0
Action taken subsequent to mental problems in previous 12 months	78 (9.7)

Table 3. Logistic regression showing the influence of factors on acknowledgement of mental problems and on intervention by GP before and after adjusting for GHQ score.

Variable	Acknowledgement of presence of mental problems				Mental health intervention			
	Not adjusted for GHQ score		Adjusted for GHQ score		Not adjusted for GHQ score		Adjusted for GHQ score	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
GHQ score per unit increase	1.13 (1.11–1.16)	<0.001			1.09 (1.04–1.13)	<0.001		
Mental problems in last 12 months (yes:no)	9.3 (5.6–15.4)	<0.001	7.2 (4.2–12.2)	<0.001	8.7 (4.9–15.4)	<0.001	7.2 (3.9–13.4)	<0.001
Mental health intervention in last 12 months (yes:no)	10.4 (5.8–18.4)	<0.001	8.2 (4.5–15.0)	<0.001	6.2 (3.4–11.4)	<0.001	4.8 (2.5 to 9.2)	<0.001
SF-36 mental summary score (per unit increase)	0.95 (0.93–0.96)	<0.001	0.97 (0.95–0.99)	<0.001	0.93 (0.90–0.96)	<0.001	0.94 (0.91–0.97)	<0.001
SF-36 physical summary score (per unit increase)	0.98 (0.96–0.99)	0.001	0.98 (0.97–0.99)	0.009	1.03 (1.00–1.07)	0.075	1.03 (1.00–1.07)	0.043
Sex (female:male)	1.25 (0.95–1.65)	0.108	1.18 (0.88–1.57)	0.263	1.00 (0.58–1.73)	0.996	0.90 (0.51–1.57)	0.703
Age (per one-year increase)	1.03 (1.02–1.04)	<0.001	1.03 (1.02–1.04)	<0.001	0.99 (0.97–1.01)	0.493	0.99 (0.97–1.01)	0.421
Ethnic group (white:non-white)	1.01 (0.74–1.37)	0.970	0.97 (0.70–1.34)	0.855	2.2 (0.99–5.0)	0.052	2.2 (0.99–5.0)	0.052
Employment status (unemployed:employed)	1.64 (1.25–2.2)	<0.001	1.63 (1.22–2.2)	<0.001	1.18 (0.67–2.1)	0.564	1.05 (0.60–1.8)	0.937
Marital status (no partner:married/with partner)	1.02 (0.78–1.33)	0.886	0.92 (0.70–1.21)	0.558	1.72 (0.98–3.0)	0.061	1.59 (0.90–2.8)	0.111
Housing status (not a property owner:owner)	1.13 (0.85–1.48)	0.399	1.04 (0.78–1.39)	0.772	1.97 (1.08–3.6)	0.027	1.85 (1.01–3.4)	0.046
Life events in last 12 months (yes:no)	1.11 (0.80–1.54)	0.524	1.14 (0.80–1.60)	0.450	2.08 (1.19–3.6)	0.010	2.06 (1.17–3.6)	0.012

Table 4(a). Logistic regression models showing adjusted odds ratios of the set of predictors of acknowledgment of mental health problems.

Variable	Adjusted odds ratio (95% CI)[a]	P-value
GHQ score per unit increase	1.10 (1.07–1.13)	<0.001
History of mental problems in last 12 months (yes:no)	7.5 (4.3–12.9)	<0.001
Age (per one-year increase)	1.03 (1.01–1.04)	<0.001
SF-36 physical summary score (per unit increase)	0.98 (0.96–1.00)	0.062

[a]Adjusted for GHQ score and other factors in the model.

Table 4(b). Logistic regression models showing adjusted odds ratios of the set of predictors of GP intervention.

Variable	Adjusted odds ratio (95% CI)[a]	P-value
History of mental problems in last 12 months (yes:no)	7.4 (3.8–14.4)	<0.001
Housing status (not a home owner:home owner)	2.1 (1.06–4.0)	0.034
Ethnic group (white:non-white)	2.2 (0.89–5.5)	0.087
Terms in interaction		
Life events in last 12 months (yes:no) if GHQ score is below 5	8.1 (2.7–24.0)	<0.001
Life events in last 12 months (yes:no) if GHQ score is 5 or more	1.03 (0.45–2.35)	0.949

[a]Adjusted for GHQ score and other factors in the model.

below five) but with little additional effect in patients who had mental problems.

Discussion

Study findings

About one-third of the workload of the participating GPs comprised patients with mental problems (judging from GHQ scores), a figure that is comparable with previous research.[1] Some patients were significantly less likely to receive mental health interventions than others, irrespective of their level of clinical need. Non-white patients were less than half as likely to receive an intervention than white patients; homeowners were less likely than those renting or homeless; and patients with recent life events were more likely to be given mental health interventions if their GHQ score was below five. For patients with a high GHQ score, the addition of life events was unimportant with respect to the likelihood of intervention. These findings were not owing to a varying degree of acknowledgement of the presence of mental problems, which suggests that they influence the GP's clinical judgement on whether or not to intervene.

Methodological considerations

This study had two particular strengths. First, it reports health care use having taken account of clinical need. Secondly, it was able to make a distinction between the factors that influence the likelihood that a GP will acknowledge a mental problem and those that influence the GP's decisions about intervention. In addition, being based on 20 doctors, the results may be generalisable. Several potential limitations need to be considered. Selection biases may have arisen during the recruitment of GPs and patients and in obtaining patients' records. It was only possible to assess the impact of the latter. This showed that the patients with missing records had similar mental health needs to those with records, but were more likely to be Black African and/or non-homeowners. Inclusion of these patients could therefore have some impact on the odds ratios reported, though the effect is likely to be minimal in view of the small numbers involved. The rate of use and the nature of interventions described cannot portray fully GPs' responses to mental problems because interventions may occur during later visits and not at the index consultation. However, any such later decisions would be difficult to relate to a patient's GHQ score at the index consultation. In order to compensate for this, any return appointments initiated by the GP were counted as mental health interventions on the assumption that such appointments were for advice, counselling or to give the GP more time to assess a patient's needs. This is borne out by the finding that GP's acknowledgement of the presence of mental problems requiring intervention was associated with return appointments (10.6% of those with mental problems recognised by the GP were offered a return appointment compared with 2.8% of those without [P = 0.002]). The cross-sectional nature of the study also explains why the referral rate (0.3%) was much lower than rates quoted in the literature (about 6%), which refer to annual rates.[2,3,12]

Relation to other studies

Housing status is a marker of socioeconomic status. Previous research has found that similar indicators, namely low education, unemployment, and minority ethnic status, were associated with a lower likelihood of having their problems recognised.[19,20,23] However, these findings were not corroborated in this study and so cannot explain the lower likelihood of intervention in these groups. Other patient characteristics, including female sex and marital separation or widowhood —previously found to be associated with problem recognition — were not confirmed in this study.[18,19,23] This may be because previous studies measured GPs' assessments of the severity of psychiatric disturbance (commonly termed 'conspicuous psychiatric morbidity').[31] Our study elicited GPs acknowledgement of the presence of mental problems and whether or not intervention was warranted. This allowed us to distinguish between GPs' acknowledgement of morbidity and their clinical judgement regarding intervention.

Explanation of results

In addition to the presence of mental problems, certain patient characteristics, namely older age and poorer physical health, increase the likelihood of acknowledgement but not of an intervention. Both age and physical health are known to be associated with mental disorder,[3,22] and it may be that GPs' awareness of this results in increased vigilance.

Our model (Figure 1) suggests that the receipt of care is determined by the presence of mental problems (a need for health),

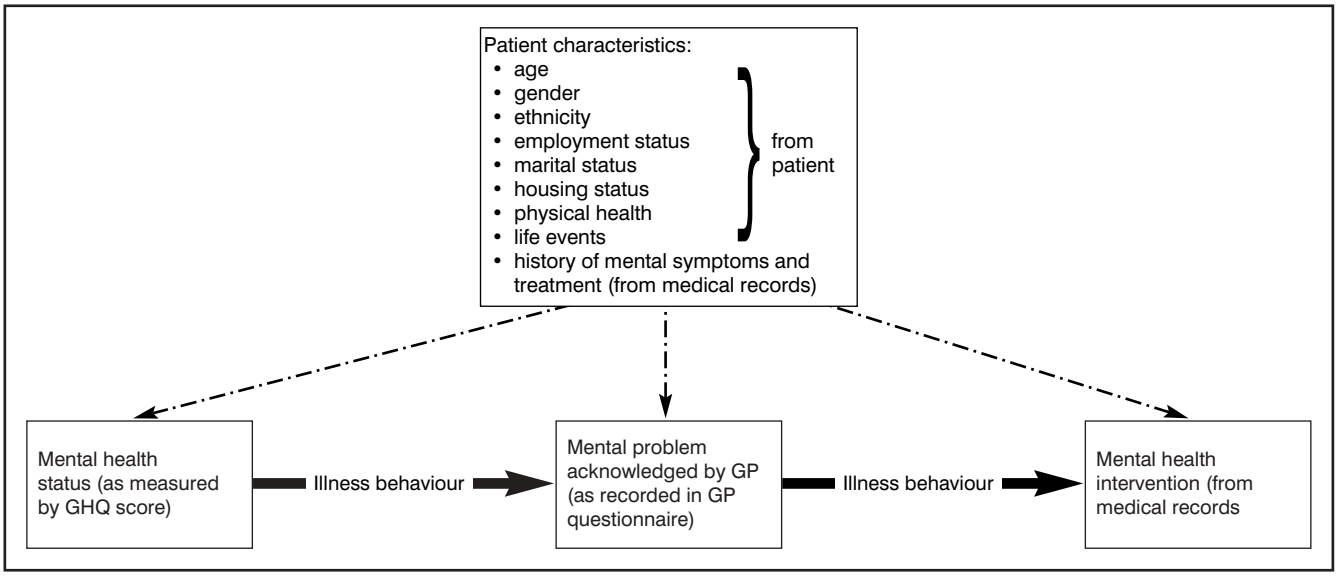

Figure 1. Model showing (i) alternative points in the decision making pathway at which patient characteristics may influence the provision of care and (ii) data sources.

the GP's acknowledgement of such morbidity, and the GP's clinical judgement as to the provision of appropriate care (a need for health care). Patient characteristics could, in theory, affect any of these.

The presence of mental problems (as measured by GHQ score) was, reassuringly, a significant predictor of intervention. It could be argued that the reason why certain groups of patients were less likely to receive care than others, irrespective of their GHQ score, was because this measure is not a specific enough indicator of clinical need. The prevalence of probable cases, as indicated by a GHQ score of over five, was greater than the reported prevalence of disorders detected by structured psychiatric interviews.[1] This could be owing to the GHQ's low threshold for transient problems for which health care is not required. However, in the univariable analyses, GHQ scores were investigated as a continuous variable to avoid any misclassification that could occur by grouping patients into cases and non-cases. In order to test the hypothesis that intervention was limited to those judged to be in need of health care, we need evidence that the factors found to err against mental health intervention, e.g. ethnic group, are those that predict spontaneous resolution.

Our findings suggest that the likelihood of intervention is not a direct consequence of a GP's acknowledgement of the presence of mental problems. Intervention may be determined by patient preferences (demand) or GPs' characteristics (supply), or a combination. Decreased likelihood of treating non-whites may indicate that GPs lack the knowledge, skills or resources to provide culturally sensitive health care. Alternatively, members of minority ethnic groups may have different expectations of health care and therefore make fewer demands on the system than their white counterparts. Finally, the findings may reflect an agreement between the doctor and patient to take no further action. The increased likelihood of treating otherwise healthy patients who have recently suffered adverse life events may reflect their frequent attendance in primary care. A previous study reports that GPs cite repeated attendance as a reason for referral.[14] As previously suggested, non-home ownership is likely to be a marker for deprivation. If GPs believe this to be a prognostic indicator for a good outcome then this would increase their likelihood of intervening.

Study implications

This study raises issues about the equitable use of mental health care. Certain groups of patients, notably members of minority ethnic groups, have a lower likelihood of receiving mental health care irrespective of their level of clinical need. On the other hand, patients who have suffered recent adverse life events have a disproportionately higher chance of receiving an intervention. In view of the large mental health caseload carried by GPs, it would seem pertinent to investigate further these results. Qualitative observations, for example, of GP-patient interactions, would help to explain our findings.

References

1. Ormel J, van den Brink W, Koeter MWJ, *et al*. Acknowledgement, management and outcome of psychological disorders in primary care: a naturalistic follow up study. *Psychol Med* 1990; **20:** 909-923.
2. Goldberg D, Huxley P. *Common mental disorders*. London: Routledge, 1992.
3. Shepherd M, Cooper B, Brown AC, Kalton G. *Psychiatric illness in general practice*. Oxford: Oxford University Press, 1966.
4. Catalan J, Gath DH, Bond A, *et al*. General practice patients on long-term psychotropic drugs. *Br J Psychiatry* 1988; **152:** 399-405.
5. Verbrugge LM. How physicians treat mentally distressed men and women. *Soc Sci Med* 1984; **18(1):** 1-9.
6. Sashidharan SP, Surtees PG, Kreitman NB, *et al*. Affective disorders among women in the general population and among those referred to psychiatrists. *Br J Psychiatry* 1990; **157:** 828-834.
7. Vazquez-Barquero JL. Mental health in primary care settings. In: Goldberg D, Tantam D (eds). *The public health impact of mental disorder*. Bern: Hogrefe and Huber, 1990.
8. Giel R, Koeter MWJ, Ormel J. Detection and referral of primary care patients with mental health problems: the second and third filter. In: Goldberg D, Tantam D (eds). *The public health impact of mental disorder*. Bern: Hogrefe and Huber, 1990.
9. Rawnsley K, Loudon JB. Factors influencing the referral of patients to psychiatrists by general practitioners. *Br J Prev Soc Med* 1962; **16:** 174-182.
10. Mowbray RM, Blair W, Jubb LG, Clarke A. The general practitioner's attitude to psychiatry. *Scot Med J* 1961; **6:** 314-321.
11. Kaeser AC, Cooper B. The psychiatric patient, the general practitioner and the outpatient clinic: an operational study and a review. *Psychol Med* 1971; **1:** 312-325.
12. Grad de Alarcon J, Sainsbury P, Costain WR. Incidence of referred mental illness in Chichester and Salisbury. *Psychol Med* 1975; **5:** 32-54.
13. Brown RMA, Strathdee G, Christie-Brown JRW, Robinson PH. A comparison of referrals to primary-care and hospital outpatient clinics. *Br J Psychiatry* 1988; **153:** 168-173.

14. Strathdee G, Brown RMA, Doig RJ. Psychiatric clinics in primary care. The effect on general practitioner referral patterns. *Soc Psychiatry Psychiatr Epidemiol* 1988; **25:** 95-100.
15. Goldberg D, Bridges K, Cook D, *et al*. The influence of social factors on common mental disorders, destabilisation and restitution. *Br J Psychiatry* 1990; **156:** 704-713.
16. Paykel ES. Depression in women. *Br J Psychiatry* 1991; **158(10):** 22-29.
17. Greenley JR. Social factors, mental illness, and psychiatric care: recent advances from a sociological perspective. *Hosp Comm Psychiatry* 1984; **35(8):** 813-820.
18. Boardman AP. The General Health Questionnaire and the detection of emotional disorder by general practitioners. *Br J Psychiatry* 1987; **151:** 373-381.
19. Hoeper EW, Nycz GR, Kessler LG, *et al*. The usefulness of screening for mental illness. *Lancet* 1984; **I:** 33-35.
20. Odell, SM, Surtees NW, Wainright NWJ, *et al*. Determinants of general practitioner acknowledgement of psychological problems in a multi-ethnic inner-city health district. *Br J Psychiatry* 1997; **171:** 537-541.
21. Vazquez-Barquero, JL, Garcia J, Simon JA, *et al*. Mental health in primary care. *Br J Psychiatry* 1997; **170:** 529-535.
22. Blacker CVR, Clare AW. Depressive disorder in primary care. *Br J Psychiatry* 1987; **150:** 737-751.
23. Marks JN, Goldberg DP, Hilier VF. Determinants of the ability of general practitioners to detect psychiatric illness. *Psychol Med* 1979; **9:** 337-353.
24. Goldberg D, Williams P. *A user's guide to the general health questionnaire.* Windsor: NFER-Nelson, 1991.
25. Ware JE, Sherbourne CD. The MOS 36-item short form health survey (SF-36): I. Conceptual framework and item selection. *Med Care* 1992; **30:** 473-483.
26. Goldberg D. Identifying psychiatric illness among general medical patients. *BMJ* 1985; **291:** 161-162.
27. Garratt AM, Ruta DA, Abdalla MI, *et al*. The SF-36 health survey questionnaire: an outcome measure suitable for use within the NHS? *BMJ* 1993; **306:** 1440-1444.
28. Brazier JE, Harper R, Jones NMB, *et al*. Validating the SF-36 health survey questionnaire: a new outcome measure for primary care. *BMJ* 1992; **305:** 160-164.
29. SPSS (1998). *SPSS Windows 8.0.* Chicago: SPSS Inc.
30. Tabachnick B, Fidell L. *Using multivariate statistics.* New York: Harper-Collins, 1996.
31. Kessel WIN. Psychiatric morbidity in a London general practice. *Br J Prev Soc Med* 1960; **14:** 16-22.

Acknowledgements

The authors would like to thank Professor George Freeman for his contribution towards the study design, Sarah Penfold and Mark Stanley for assisting in the recruitment of patients and data extraction, Louise Howard and our reviewers for their comments on the manuscript, and the general practitioners, receptionists, and patients who participated in the study.

Address for correspondence

Dr R Raine, Health Services Research Unit, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT. E-mail: rosalyn.raine@lshtm.ac.uk