

A comparison between somatic symptoms with and without clear organic cause: results of an international study

S. KISELY,¹ D. GOLDBERG AND G. SIMON

From the Department of Psychiatry, University Hospital of South Manchester, Manchester

ABSTRACT

Background. The aim of this study was to determine differences between patients attending primary-care clinics with somatic symptoms for which no organic cause can be found, and those with a clear organic basis for their complaints.

Methods. Physical and psychiatric morbidity was measured in 5447 subjects presenting for primary care in 14 countries. Subjects were recruited using a two-stage design from 26969 consecutive attenders and 25916 (96.5%) subjects were successfully screened using the General Health Questionnaire (GHQ-12). The response rate for the second-stage assessment was 63% and consisted of the Composite International Diagnostic Instrument adapted for use in primary care (CIDI-PHC), the 28-item GHQ, the Groningen Social Disability Schedule (GSDS) and GP ratings to assess physical psychiatric and social status. Patients who reached the threshold for the number of somatic symptoms (five or more symptoms) were then divided into two groups on the basis of whether their somatic symptoms were medically explained or not.

Results. The presence of somatic symptoms, irrespective of aetiology, was associated with increased social and psychiatric morbidity. In the case of non-medically explained symptoms there was a clear linear relationship while with medically explained symptoms psychiatric morbidity rose sharply in the presence of more than 11 symptoms. Patients who had five or more non-medically explained symptoms were significantly younger, had greater psychiatric morbidity, were at greater risk of harmful use of alcohol and reported greater social disability than those with a medical explanation for their somatic symptoms. Patients who had an excess of somatic symptoms in both categories had especially high rates of social and psychiatric morbidity.

Conclusions. These results show a strong association between somatic symptoms irrespective of aetiology and psychiatric morbidity across disparate cultures.

INTRODUCTION

Patients who present with physical symptoms without significant organic cause (somatizers) are commonly seen in general hospital wards and out-patient departments (Mayou & Hawton, 1986). Studies of out-patients attending hospital clinics in Britain and the United States suggest that patients with somatic symptoms for which no organic cause can be found differ in several significant ways from those patients who have a

clear organic cause for their complaint: they are younger, more likely to be female (Bass & Wade, 1984; Mayou & Hawton, 1986; Mayou, 1989) and report significantly more psychiatric morbidity (Clouse & Lustman, 1982; Bass & Wade, 1984; Mayou & Hawton, 1986; Mayou, 1989). Similar findings have been reported in studies of out-patients outside Europe and North America (Otsyula & Rees, 1972; Holmes & Speight, 1975).

In primary care, the differences between somatizers and those with an organic cause for their physical symptoms are less marked. Studies have either shown that levels of psychiatric

¹ Address for correspondence: Dr S. Kisely, Mental Health Commissioning Team, Birmingham Health Authority, 1 Vernon Road, Edgbaston, Birmingham B16 9SA.

morbidity between somatizers and those with medically explained symptoms are comparable (Weich *et al.* 1995), or that there is a differing symptom profile with patients with medically explained symptoms being more likely to have psychiatric disorder characterized by anxiety only (Craig *et al.* 1993). In contrast to studies of hospital out-patients, these studies were not primarily concerned with differences between non-medically explained and medically explained symptoms in terms of sociodemographic or lifestyle variables.

Studies have also demonstrated that the presence of multiple somatic symptoms or self-reported symptoms of pain dramatically increases the likelihood of psychiatric co-morbidity (Dworkin *et al.* 1990; Katon *et al.* 1991; Simon & VonKorff, 1991; Craig *et al.* 1993; Kroenke *et al.* 1994). Increasing numbers of somatic symptoms are associated with linear increases in psychiatric caseness, the association with psychiatric disorder being most marked for those patients with five or more symptoms whether or not they appear to have a medical 'explanation' (Katon *et al.* 1991; Simon & VonKorff, 1991; Kisely & Goldberg; 1996).

The present paper considers differences between patients attending primary-care clinics with somatic symptoms for which no organic cause can be found, and those with a clear organic basis for their complaints. The report uses data from the World Health Organization international study of Psychological Problems in General Health Care (the PPGHC study, Ustun & Sartorius, 1995). The large number of subjects in the PPGHC study (over 5000) allowed the examination of differences between patients attending primary care with and without clear organic cause for their somatic symptoms from 15 participating centres in 14 countries. Specifically, this paper aimed to determine whether the demographic differences found in studies of somatizers in hospital settings would be replicated in primary-care patients, as well as to investigate the relationships between psychological distress and somatic symptoms that have a medical explanation, as opposed to those that do not.

This research also aimed to gather information on the exact relationship between psychological distress and somatic symptoms. It is possible that patients with psychiatric disorder may show

increased symptom sensitivity, in which case there will be a greater association between psychiatric caseness and non-medically explained symptoms. To the extent that psychiatric disorder is secondary to somatic symptoms, then medically explained and non-medically explained symptoms will show an equal association with psychiatric morbidity.

METHOD

This research formed part of the World Health Organization Collaborative Study of Psychological Disorders in General Health Care Settings (PPGHC). The prevalence, management and outcome of common psychological disorders in primary-care patients were investigated in 15 centres. Participating centres included Ankara, Athens, Bangalore, Berlin, Groningen, Ibadan, Mainz, Manchester, Nagasaki, Paris, Rio de Janeiro, Santiago, Seattle, Shanghai and Verona in Italy. The overall study methods including details of power calculations have been described fully elsewhere (Ustun & Sartorius, 1995).

At each centre, consecutive adult primary-care attenders aged between 16 and 65 were screened using the 12-item General Health Questionnaire (GHQ) (Goldberg & Williams, 1988). A stratified random sample (weighted toward higher GHQ scorers) was selected for a diagnostic assessment.

Psychiatric morbidity was measured using the 28-item General Health Questionnaire (GHQ-28) (Goldberg & Williams, 1988) and primary-care version of the Composite International Diagnostic Interview (CIDI-PHC) (Sartorius *et al.* 1993). Physical disability was assessed with the Brief Disability Questionnaire (BDQ) (Stewart *et al.* 1988) adapted from the Medical Outcomes Survey Short Form 36, and social disability with the Groningen Social Disability Schedule (GSDS) (Wiersma *et al.* 1990). For each patient selected for this diagnostic assessment, the treating physician completed a brief questionnaire regarding current physical and psychological illness. Results were then weighted back to the original screened sample.

Psychiatric caseness was, therefore, defined in three ways; by computer algorithm using the CIDI-PHC scores, by the GHQ-28 using a threshold score of 10/11 and by GP assessment.

The CIDI-PHC has been successfully used in physically ill patients, and allows the assessment of both medically explained and non-medically explained somatic symptoms in the preceding 4 weeks. For each symptom elicited, subjects were asked for details of diagnosis, investigations and treatment in a highly structured way using a flow chart to establish the presence of an organic illness (Robins *et al.* 1988).

Somatic symptoms were only coded as being due to a physical illness or injury if a doctor had been consulted for the symptom and if that doctor had given the patient a definite diagnosis, or if there had been any abnormalities reported on examination or on investigations. In the absence of a specific medical diagnosis, or abnormalities on examination or investigation, the symptom was coded as being non-organic in aetiology. The latter included both somatized psychological symptoms, as well as symptoms which might eventually prove to have some degree of specific organic aetiology. Mild symptoms that had not led to consultation with a health care professional, the use of medication on more than one occasion, or marked interference with normal activities were excluded.

In addition, a symptom was only considered to be due to a physical illness if the complaint had always been due to the stated physical condition; otherwise it was recorded as being non-medically explained. Finally, ratings were also reviewed by a medically qualified member of the interviewing team.

Using the same computer algorithm that was derived from the CIDI-PHC, it was possible to calculate the overall medically explained and non-medically explained symptom scores as well as to divide both sets of symptoms into three groups: no symptoms, subthreshold symptoms (1–4), and moderate to severe symptoms (≥ 5). Patients who reached the thresholds for the number of somatic symptoms were then divided into groups on the basis of whether their somatic symptoms were medically explained or not. The characteristics of these groups were compared with those where symptoms were absent or subthreshold using odds ratios. The odds ratios were adjusted using logistic regression in order to control for differences in diagnostic practices between sites in determining which symptoms were medically explained. Finally, patients who exceeded the threshold for medically and non-

medically explained symptoms were directly compared using the chi-square test.

RESULTS

Prevalence of medically explained and non-medically explained somatic symptoms

Of 26969 subjects who were approached, 25916 (96.5%) subjects were successfully screened using the General Health Questionnaire (GHQ-12) (Ustun & Sartorius, 1995). A total of 5447 patients subsequently completed the second-stage interview out of eligible 8698 subjects (a response rate of 63%). The likelihood of completing the interview was not related to age, gender or initial GHQ-12 score.

Fig. 1 shows that there was a wide variation in the prevalence of medically explained somatic symptoms between sites this difference being statistically significant ($\chi^2 = 101$, $df = 14$, $P = 0.0000$). Overall, 7.9% of subjects ($N = 432$) reported five or more medically explained symptoms with a range of between 2.6% and 18.8%. There was a similarly wide range of prevalence for non-medically explained symptoms (Fig. 1) which was also statistically significant ($\chi^2 = 314$, $df = 14$, $P = 0.0000$). Nearly 15% of the sample had five or more non-medically explained symptoms ($N = 837$) with a range of between 4.8% and 24.5% (Fig. 1). Non-medically explained symptoms occurred more commonly than medically explained symptoms, the prevalence of five or more non-medically explained symptoms being double the prevalence of a similar threshold of medically explained symptoms. The excess of non-medically explained symptoms over medically explained symptoms held true for all the centres except Berlin and Seattle (Fig. 1).

Medically and non-medically explained somatic symptoms often occurred together, both set of symptoms showing a significant association (Spearman's $\rho = 0.15$, $P = 0.000$); 119 patients (2.2%) had five or more symptoms from both categories (Table 1).

The relationship between somatic symptoms and psychiatric morbidity

In the case of both medically explained and non-medically explained symptoms, there was an association between an increasing number of somatic symptoms and psychiatric caseness as

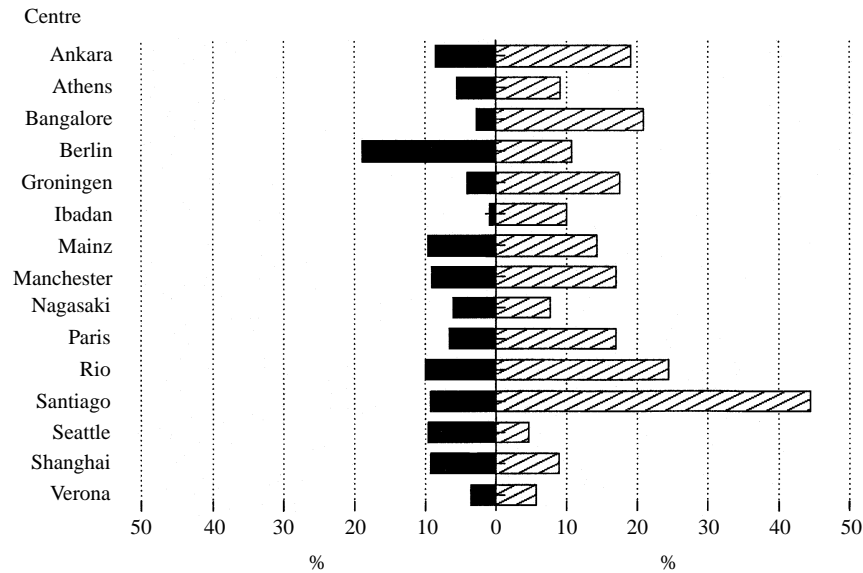


FIG. 1. Prevalence of five or more somatic symptoms (■, medical symptoms; ▨, non-medical symptoms) by centre.

Table 1. *The association between medically explained and non-medically explained somatic symptoms*

Non-medically explained symptoms	Medically explained symptoms			Significance
	0-4	≥ 5	Total	
0-4	4297	313	4610	$\chi^2 = 53.6$ df = 1 $P = 0.0000$
≥ 5	718	119	837	
Total	5015	432	5447	

measured by either the GHQ (Fig. 2*a*) or CIDI-PHC (Fig. 2*b*). This relationship was particularly marked in the case of non-medically explained symptoms where there was a linear relationship with psychiatric disorder. Each additional somatic symptom made an incremental contribution until by around 16 symptoms the probability of caseness was near 100%. Whereas only 83 out of 2160 patients with no medically explained symptoms (4%) were CIDI-PHC psychiatric cases, this rose to 444 out of 2450 patients with between one and four non-medically explained symptoms (18%), and 578 out of 837 with five or more symptoms (69%). The Mantel-Haenszel test of linearity confirmed that this association was highly significant ($\chi^2 = 1598$, df = 1, $P = 0.0000$).

In the case of medically explained symptoms the relationship with psychiatric disorder was more curvilinear with a sharp increase over a threshold of between 11 and 12 somatic symptoms. In those with no medically explained symptoms, 16% (342 out of 2178) were CIDI-PHC cases, rising to 20% (578 out of 2837) in those with one to four medically explained symptoms, and 43% (186 out of 432) in those with five or more such symptoms. The Mantel-Haenszel test of linearity again confirmed that this association was highly significant ($\chi^2 = 165$, df = 1, $P = 0.0000$).

Differences between patients with medically explained and non-medically explained somatic symptoms

Table 2 contrasts the differences between patients with five or more non-medically explained symptoms alone (a 'somatizer' group $N = 313$), those with five or more medically explained somatic symptoms alone (a 'medically explained' group, $N = 718$) and those with five or more of both sets of symptoms (a 'combined' group, $N = 119$) compared to patients where somatic symptoms were absent or subthreshold ($N = 4297$). Patients with five or more somatic symptoms whether medically explained or not were significantly more likely to be female (Table

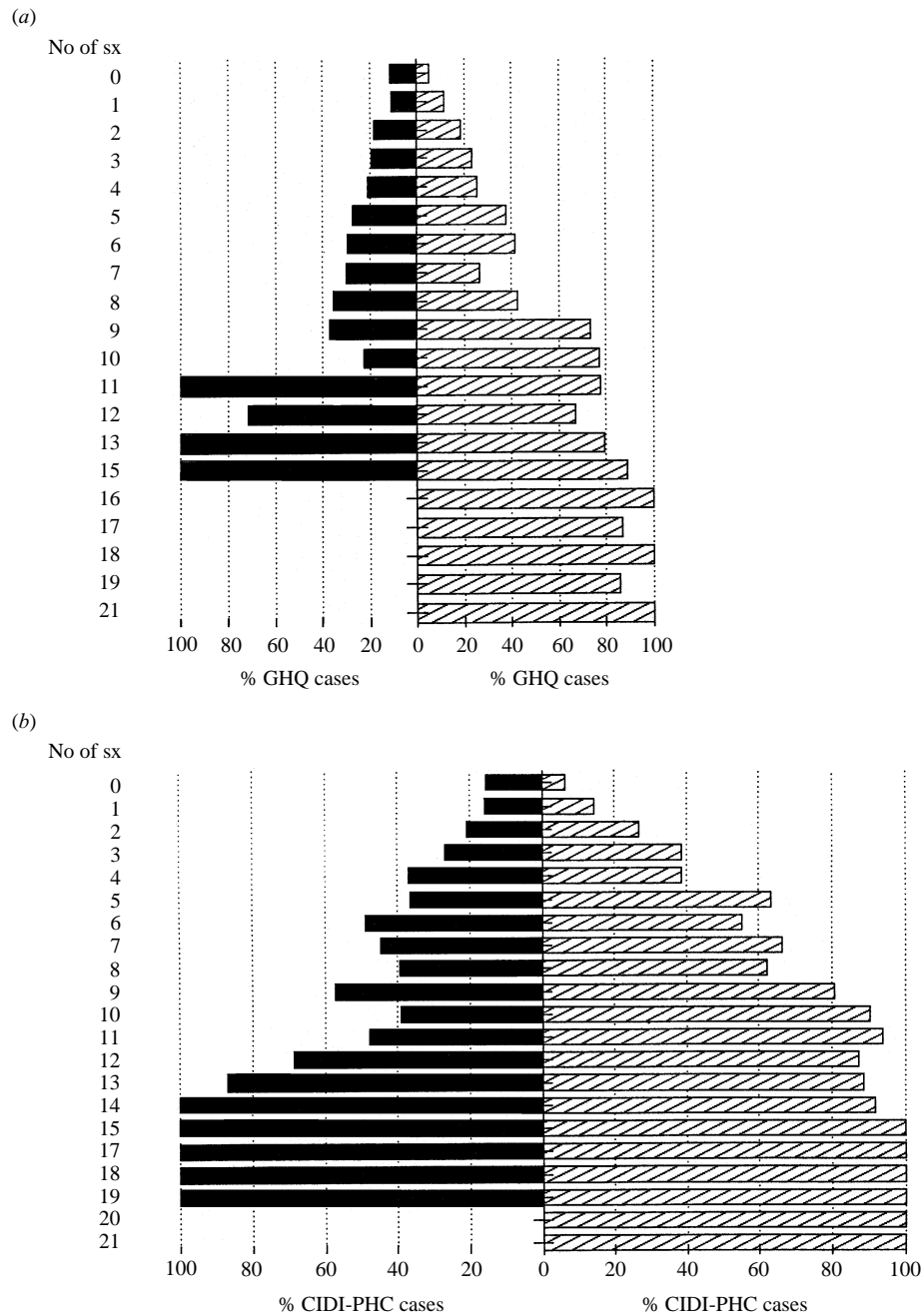


FIG. 2. Somatic symptoms (■, medical; ▨, non-medical) and caseness: (a) GHQ; (b) CIDI-PHC.

2). Those with five or more medically explained symptoms were of older age. There was no significant relationship between marital status and somatic symptom count.

Three patterns emerged when the relationship between psychosocial morbidity and somatic symptoms was examined. In terms of psychiatric morbidity as measured by the GHQ (Table 2),

Table 2. Differences in sociodemographic and clinical features between patients with and without significant levels of somatic symptoms

	Somatic symptoms						
	None/ subthreshold (0-4 symptoms) N = 4297 (%)	Medically explained only (≥ 5 symptoms) N = 313 (%)	Adjusted odds ratio (95% CI)	Non-medically explained only (≥ 5 symptoms) N = 718 (%)	Adjusted odds ratio (95% CI)	Medically and non-medically explained* N = 119 (%)	Adjusted odds ratio (95% CI)
Sex							
M	1785 (41.4)	94 (30.2)	1.89 (1.5-2.4)	170 (23.7)	2.3 (1.9-2.8)	23 (19.5)	2.90 (1.8-4.7)
F	2512 (58.6)	218 (69.9)		548 (76.3)		96 (80.5)	
Age							
15-42	2567 (60)	105 (33.6)	2.51 (2.1-3.1)	440 (61.2)	0.96 (0.8-1.1)	55 (46.5)	1.78 (1.2-2.6)
≥ 43	1730 (40)	208 (66.4)		278 (38.8)		64 (53.5)	
Employment status†							
Employed	2003 (50.0)	110 (40.3)	1.36 (1.1-2.0)	245 (36.0)	1.78 (1.4-2.0)	52 (46.8)	1.12 (0.8-1.7)
Not employed	2009 (50.0)	162 (59.7)		433 (64.0)		59 (53.2)	
Physical disability (BDQ)	1111 (26.0)	201 (64.4)	6.2 (5.0-7.7)	453 (63.1)	4.9 (4.2-5.9)	96 (80.7)	12.2 (7.6-19.5)
Social disability (GSDS)	1578 (37.0)	187 (60.2)	2.7 (2.2-3.4)	522 (73.6)	4.7 (3.9-5.6)	96 (80.7)	7.69 (4.7-12.5)
Psychiatric case (GHQ)	335 (7.8)	74 (23.6)	6.6 (5.2-8.4)	319 (44.4)	9.4 (7.8-11.4)	62 (52.5)	13.05 (8.8-18.9)
Psychiatric case (CIDL-PHC)	422 (9.8)	105 (33.4)	4.61 (3.6-6.0)	497 (69)	20.6 (17.1-24)	81 (68)	19.5 (13.0-29)
GP diagnosed psychiatric case	786 (19.0)	99 (32.3)	2.3 (1.9-2.9)	344 (49.2)	4.00 (3.6-5.1)	46 (40.7)	3.00 (2.0-4.4)
Harmful use of alcohol	202 (4.8)	24 (5.5)	1.2 (0.8-1.8)	63 (8.8)	1.9 (1.4-2.6)	7 (5.8)	1.22 (0.6-2.7)

* Five or more non-medically explained somatic symptoms and five or more medically explained symptoms.

† Data was missing on 375 subjects.

there was a clear gradient of increasing severity from patients with subthreshold somatic symptoms, through the 'medically explained' and 'somatizer' groups to those with five or more of each category (the 'combined' group). Patients in the 'combined' group had a thirteen-fold risk of psychiatric disorder compared to those where somatic symptoms were absent or subthreshold. Social and physical disability showed a very similar relationship. This suggests that the effect of medical and non-medical symptoms in these cases may be additive.

However, psychiatric caseness as determined by the CIDI-PHC or a diagnosis by the treating GP of overall psychiatric caseness showed a different relationship. In these cases, morbidity was highest in the presence of non-medically explained symptoms and there were no additive effects with medically explained symptoms (Table 2). The relationship was similar for the harmful use of alcohol.

Characteristics of patients in the 'combined' group

A direct comparison between patients in the 'medically explained', 'somatizers', and 'combined' groups (Table 2) confirmed that 'somatizers' were significantly younger ($\chi^2 = 68.4$, $df = 2$, $P = 0.0000$), and were more likely to be psychiatric cases as determined by the GHQ ($\chi^2 = 48.8$, $df = 2$, $P = 0.0000$), CIDI-PHC ($\chi^2 = 160.1$, $df = 2$, $P = 0.0000$) or treating GPs ($\chi^2 = 25.4$, $df = 2$, $P = 0.0000$). For GHQ psychiatric cases this relationship was especially marked in the 'combined' group (Table 2). A similar pattern was seen for physical and social disability (Table 2).

Similarly, the proportion of subjects who were female (Table 2) rose through the 'medically explained', 'somatizer' and 'combined' groups ($\chi^2 = 7.09$, $df = 2$, $P = 0.03$). Although both groups of patients showed high levels of social disability as a result of their symptoms, those with non-medically explained symptoms were significantly more disadvantaged, and those in the 'combined' group especially so ($\chi^2 = 26.7$, $df = 2$, $P = 0.0000$). Harmful use of alcohol was significantly more likely to occur in the group with non-medically explained symptoms where the prevalence was three times greater than it was in patients with medically explained symptoms.

DISCUSSION

This large multi-centre study has demonstrated a significant relationship between somatic symptoms and psychiatric caseness in a large range of cultural settings and confirms previous work in the United States and Britain showing an association between the number of somatic symptoms and psychiatric co-morbidity (Dworkin *et al.* 1990; Katon *et al.* 1991; Simon & VonKorff, 1991; Craig *et al.* 1993; Kroenke *et al.* 1994; Kisely & Goldberg, 1996). There do, however, appear to be significant differences between symptoms that are medically and non-medically explained. Whereas there is a threshold effect in the case of medically explained symptoms such that morbidity only increased in excess of 11 or 12 symptoms, non-medically explained somatic symptoms showed a more linear relationship.

The distinction between medically explained and non-medically explained symptoms can be difficult to establish as physical symptoms can result from an interaction between psychological and social factors. The design of the study allowed for the number of somatic symptoms and the determination of whether they were medically explained or not to be collected in a uniform and reliable manner across settings. Data on psychiatric morbidity was collected using three different methods (GHQ-28, CIDI-PHC and GP ratings) to ensure that any relationship between somatic symptoms and psychiatric illness was not due to the same symptoms being included in the CIDI-PHC symptom counts. It is possible that the differing proportions of medically explained and non-medically explained somatic symptoms between centres may have been due to differing diagnostic practices and varying degrees of access to facilities for investigation. This might account for the finding that it was only in Berlin and Seattle that there was an excess of medically explained as opposed to non-medically explained symptoms. The odds ratios in this study were, therefore, adjusted to take into account these inter-centre differences. One disadvantage of the CIDI-PHC is that the assessment of whether a somatic symptom is non-medically explained is based on the exclusion of a medical explanation rather than a positive diagnosis. Some medically explained symptoms that have not been fully

investigated may, therefore, be misclassified as non-medically explained, so masking some of the differences between the two groups.

Nevertheless, significant differences between patients with medically and non-medically explained symptoms did emerge. General practice patients who had five or more non-medically explained symptoms were significantly younger, had greater psychiatric morbidity, were at greater risk of harmful use of alcohol and reported greater social disability than those with a medical explanation for their somatic symptoms. Patients in the 'combined' group were especially likely to be female, and show the greatest degree of psychiatric and social morbidity. The differences between medically explained and non-medically explained symptoms may be greater than the present findings suggest, because of the possibility of misclassification between the two sets of symptoms.

Similar findings have been reported in hospital studies of patients. In one study of attenders for coronary angiography, two-thirds of patients with non-organic chest pain were psychiatric cases as opposed to one quarter of those with a medical explanation for their pain (Bass & Wade, 1984). Female sex has also been associated with non-medically explained symptoms in out-patient studies (Bass & Wade, 1984; Katon *et al.* 1988).

There may be a number of explanations for the relationship between somatic symptoms and psychiatric morbidity. In the case of medically explained symptoms, the association with increased psychiatric morbidity is unlikely to be due to the concurrent presence of non-medically explained somatic symptoms. Although both categories of somatic symptoms often occurred together, the association between the 'medically explained' group and psychiatric morbidity persisted when individuals with five or more non-medically explained somatic symptoms were considered separately as the 'combined' group. The relationship may, therefore, be due to factors inherent in the physical disease process. Irrespective of setting, certain physical conditions are related to particularly high rates of psychiatric illness, including chronic neurological disorder, heart disease and chronic lung disorders. The mechanisms for such an association might include the presence of chronic

pain, physical disability, site of lesion in the case of stroke and perception of the life-threatening nature of the illness in the case of heart disease.

In the case of non-medically explained symptoms, these may represent physiological manifestations of underlying psychiatric disorders such as panic disorder in the case of non-specific chest pain (Bass & Wade, 1984; Katon *et al.* 1988), a culturally acceptable form of expressing psychological morbidity, or arise from a lowering of symptom thresholds in distressed patients (Kroenke & Price, 1993; Simon *et al.* 1996). It has been suggested that the association between psychiatric morbidity and somatic symptoms may be due to the fact that psychological distress can heighten the perception of all types of unpleasant somatic symptom (Kroenke & Price, 1993; Simon *et al.* 1996), including those attributable to well-defined medical disorders (Simon *et al.* 1996). An international study has shown that somatic symptoms show a generally similar pattern of association with psychological distress among patients from Western and non-Western countries indicating that cultural factors are less important than previously thought, although they may influence subsequent illness behaviour (Simon *et al.* 1996).

There may also be a relationship with cigarette or alcohol use. Patients in the present study with non-medically explained symptoms were three times as likely to be drinking alcohol at harmful levels compared to those with medically explained symptoms. In a previous UK study comparing medically explained and non-medically explained chest pain, subjects with non-specific symptoms also showed a significantly higher consumption of alcohol and cigarettes (Kisely *et al.* 1992). This increased level of alcohol consumption and smoking may contribute to non-medically explained somatic symptom by exacerbating physiological causes (Matsuguchi *et al.* 1984; Kahrilas & Gupta, 1990), or arise as a reflection of psychiatric disorder.

These patients may be at high risk of continuing morbidity. A follow-up study of patients attending general medical out-patient clinics reported that of 14 common somatic symptoms, an organic aetiology was demonstrated in only 16% of cases. One year later only 53% of symptoms had improved, and a poor

prognosis was related to the absence of an organic aetiology, a symptom duration of more than 4 months, and a history of two or more symptoms (Kroenke & Mangelsdorff, 1989). A follow-up study of new admissions with chest pain reported that patients with non-organic symptoms had more psychiatric morbidity than those with organic pain. This disparity increased over the course of the subsequent 3 months so that, by follow-up, 33% of ischaemic heart disease patients and 59% of non-specific chest pain patients had psychiatric disorder (Kisely *et al.* 1992).

The present work among GP attenders has highlighted the need for more studies to determine the outcome in general practice of patients with non-medically explained symptoms, and indicates possible discriminating factors which may help in diagnosis. Recognition and intervention in the areas of alcohol and cigarette use may offer possible strategies for treatment. This study has also highlighted that although overall levels of psychiatric morbidity are lower among patients with medically explained symptoms, they reach comparable levels in excess of 11 or 12 symptoms and that these patients also require appropriate psychiatric intervention.

REFERENCES

- Bass, C. & Wade, C. (1984). Chest pain with normal coronary arteries: a comparative study of psychiatric and social morbidity. *Psychological Medicine* **14**, 51–61.
- Clouse, R. E. & Lustman, P. J. (1982). Psychiatric illness and contraction abnormalities of the oesophagus. *New England Journal of Medicine* **309**, 1337–1342.
- Craig, T. J. K., Boardman, A. P., Mills, K., Daly-Jones, O. & Drake, H. (1993). The South London Somatisation Study. 1: Longitudinal course and the influence of early life experiences. *British Journal of Psychiatry* **163**, 579–588.
- Dworkin, S. F., Von Korff, M. & LeResche, L. (1990). Multiple pains and psychiatric disturbance, an epidemiologic investigation. *Archives of General Psychiatry* **47**, 239–245.
- Goldberg, D. P. & Williams, P. (1988). *A User's Guide to the General Health Questionnaire: GHQ*. NFER-NELSON: Windsor.
- Holmes, J. A. & Speight, A. N. P. (1975). The problem of non-organic illness in Tanzanian urban medical practice. *East African Medical Journal* **52**, 225–236.
- Kahrilas, P. J. & Gupta, R. R. (1990). Mechanism of acid reflux associated with cigarette smoking. *Gut* **31**, 4–10.
- Katon, W., Hall, M. L., Russo, J., Cormier, L., Hollifield, M. & Vitaliano, P. P. (1988). Chest pain: Relationship of psychiatric illness to coronary angiogram results. *American Journal of Medicine* **84**, 1–9.
- Katon, W., Lin, E., Von-Korff, M., Russo, J., Lipscomb, P. & Bush, T. (1991). Somatization: a spectrum of severity. *American Journal of Psychiatry* **148**, 34–40.
- Kisely, S. R. & Goldberg, D. P. (1996). Physical and psychiatric comorbidity in general practice. *British Journal of Psychiatry* **169**, 236–242.
- Kisely, S. R., Creed, F. H. & Cotter, L. (1992). The course of psychiatric disorder associated with non-specific chest pain. *Journal of Psychosomatic Research* **36**, 329–335. (Published erratum appears in *Journal of Psychosomatic Research*, 1993, **37**, 789.)
- Kroenke, K. & Mangelsdorff, A. D. (1989). Common symptoms in ambulatory care: incidence, evaluation, therapy, and outcome. *American Journal of Medicine* **86**, 262–266.
- Kroenke, K. & Price, R. K. (1993). Symptoms in the community. Prevalence, classification and psychiatric co-morbidity. *Archives of Internal Medicine* **153**, 2474–2480.
- Kroenke, K., Spitzer, R. L., Williams, J. B., Linzer, M., Hahn, S. R., deGruy, F. V. & Brody, D. (1994). Physical symptoms in primary care. Predictors of psychiatric disorders and functional impairment. *Archives of Family Medicine* **3**, 774–779.
- Matsuguchi, T., Araki, H., Anan, T., Hayata, N., Nakaguki, O., Takeshita, A. & Nakamuri, M. (1984). Provocation of variant angina by alcohol ingestion. *European Heart Journal* **5**, 906–912.
- Mayou, R. (1989). Atypical chest pain. *Journal of Psychosomatic Research* **33**, 393–406.
- Mayou, R. & Hawton, K. (1986). Psychiatry in the General Hospital. *British Journal of Psychiatry* **149**, 172–190.
- Otsyula, W. & Rees, P. H. (1972). The occurrence and recognition of minor psychiatric illness among outpatients at the Kenyatta National Hospital, Nairobi. *East African Medical Journal* **49**, 825–829.
- Robins, L. N., Wing, J., Wittchen, H. U., Helzer, J. E., Babor, T. F., Burke, J., Farmer, A., Jablenski, A., Pickens, R., Regier, D. A., Sartorius, N. & Towle, L. H. (1988). The Composite International Diagnostic Interview. An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Archives of General Psychiatry* **45**, 1069–1077.
- Sartorius, N., Ustun, T. B., Costa-e-Silva, J. A., Goldberg, D., Lecrubier, Y., Ormel, J., Von-Korff, M. & Wittchen, H. U. (1993). An international study of psychological problems in primary care. *Archives of General Psychiatry* **50**, 819–824.
- Simon, G. & VonKorff, M. (1991). Somatization and psychiatric disorders in the NIMH Epidemiologic Catchment Area Study. *American Journal of Psychiatry* **148**, 1494–1500.
- Simon, G., Gater, R., Kisely, S. & Piccinelli, M. (1996). Somatic symptoms of distress: an international primary care study. *Psychosomatic Medicine* **58**, 481–488.
- Stewart, A. L., Hays, R. D. & Ware, J. E. J. (1988). The MOS short-form general health survey: reliability and validity in a patient population. *Medical Care* **26**, 819–824.
- Ustun, T. B. & Sartorius, N. (1995). *Mental Illness in General Health Care*. John Wiley: Chichester.
- Weich, S., Lewis, G., Donmall, R. & Mann, A. (1995). Somatic presentation of psychiatric morbidity in general practice. *British Journal of General Practice* **45**, 143–147.
- Wiersma, D., Jong, A., Kraaijkamp, H. & Ormel, J. (1990). *GSDS: The Groningen Social Disabilities Schedule, 2nd edn*. University of Groningen: Groningen.