# Somatic and psychological models of common mental disorder in primary care in India

V. PATEL,[1] J. PEREIRA AND A. H. MANN

*From the Institute of Psychiatry and Human Behaviour, Altinho, Panjim, Goa, India; and the Institute of Psychiatry, London*

## ABSTRACT

**Background.** Primary care attenders with a common mental disorder (CMD) frequently present with somatic symptoms. This study aimed to examine somatic and psychological models of CMD in primary care attenders in India.

**Methods.** Cross-sectional survey of attenders at two primary care clinics. Psychiatric caseness was determined on three criteria: standardized psychiatric interview (biomedical criterion), patients' self-assessment of emotional disorder (emic criterion) and health care provider diagnosis. The GHQ-12 and the PPQ, which emphasize psychological and somatic symptoms respectively, were used as screening instruments.

**Results.** Although somatic symptoms were the presenting complaints for 97% of subjects, 51% of subjects with a biomedically defined CMD had a psychological illness attribution. Patients with psychological attributions were more likely to be women, to have a longer duration of illness, to have higher CISR scores and were more likely to be recognized by the primary health care (PHC) physician. The GHQ-12 was superior to the PPQ in identifying cases of CMD against the biomedical criterion for both psychologizers and somatizers; both instruments performed equally well against the emic and care provider criteria.

**Conclusions.** Psychological models may be acquired by patients as CMD becomes more chronic or severe, making them more likely to be detected by PHC physicians. Psychological symptoms are superior to somatic symptoms in detecting CMD. Shorter versions of the GHQ have comparable discriminating abilities to the 12-item version and offer the practical advantage of brevity, which may make them more acceptable to PHC physicians as a clinical screening tool.

## INTRODUCTION

Common mental disorders (CMD) are a group of distress states, previously termed neuroses, that describe states of anxiety and depression. CMD are among the most frequent and disabling disorders in primary care attenders (Ormel *et al.* 1994). The presenting complaints of CMD in primary care are usually somatic; some patients may admit to having emotional symptoms on enquiry while others persist in attributing their illness to bodily causes. The latter process, i.e.

the presentation of CMD with somatic symptoms in a subject who attributes the symptoms to physical causes, is referred to by some authors as somatization (Goldberg & Bridges, 1988). Although somatic presentations were considered to be more common in developing countries, it is now acknowledged that they are also common in industrialized countries; some authors have argued that 'from the cross-cultural perspective, it is not somatization but psychologization in the West that appears unusual and requires explanation' (Kleinman & Kleinman, 1985). Somatic presentations have been linked to low recognition rates of CMD by primary care physicians (Paykel &

[1] Address for correspondence: Dr Vikram Patel, Sangath Centre, 71 Defence Colony, Alto Porvorim, Goa 403521, India.

Priest, 1992). Psychiatric morbidity can be detected in up to half of adult primary care attenders in India (Shamasundar *et al.* 1986; Sen, 1987). Up to two-thirds of this morbidity is unrecognized and untreated or treated with inappropriate medication with profound implications on health service use, loss of working ability and persisting symptomatology in this population.

Epidemiological research in India has used both etic and emic instruments. Etic instruments are those which have been developed in a culture foreign to the study area and an example of such an instrument used in India is the General Health Questionnaire (GHQ) (Goldberg & Williams, 1988). Emic instruments, on the other hand, are developed locally and are usually derived from symptoms commonly used by patients in the study area; the Primary care Psychiatric Questionnaire (PPQ) (Srinivasan & Suresh, 1990) is an emic instrument in India. While the GHQ comprises mainly of psychological symptoms, the PPQ consists mainly of somatic symptoms. The latter emphasis is based on the rationale that somatic symptoms may be more practical and accurate in detecting CMD in low-income countries (Ebigbo, 1982; Srinivasan & Suresh, 1990).

This paper describes some of the results of a study investigating the prevalence and associations of CMD in primary care attenders in Goa, India. Detailed findings on the prevalence, explanatory models, socio-economic associations, disability and primary care diagnoses and treatments are reported elsewhere (Patel *et al.* 1998). This paper aims to examine the role of somatic and psychological symptoms as features of CMD in primary care attenders in India. The paper has four specific objectives: first, to examine the proportion of PHC attenders with a CMD who attributed their illness to bodily causes only; secondly, to compare the clinical and sociodemographic features of subjects with a CMD who have somatic, psychological and mixed attributions of their illness and examine the hypothesis that subjects with a CMD who had psychological attributions were more likely to be identified as cases by their physicians; thirdly, to examine the hypothesis that an emic screening questionnaire based on somatic symptoms (PPQ) would be superior in identifying CMD when compared to

an etic questionnaire based on psychological symptoms (GHQ-12); and fourthly, to determine whether shorter versions of these instruments discriminated CMD as well as the full versions.

## METHOD
### Sample
For this cross-sectional survey two Primary Health Clinics (PHC) in the state of Goa, on the west coast of India, were selected. One PHC was sited in a peri-urban area while the other was in a rural area: the two PHC were chosen so that both rural and urban patients could be studied.

The clinics operated in the morning hours only. On 5 days each week for a period of 6 weeks simple random sampling of consecutive out-patient attenders was carried out. Attenders aged below 16 years or over 65 years, or needing urgent medical treatment or who were unable to understand Konkani or English were excluded. All patients were required to give written informed consent. On average, five or six patients were recruited daily in each PHC.

### Interviews
#### *Explanatory Model Interview* (*EMI*)
The EMI is a semi-structured interview based on Kleinman's (1980) suggested questions for eliciting explanatory models, i.e. how patients describe and explain various aspects of an illness experience (Lloyd *et al.* 1996). The Konkani version of the EMI used in this study elicited sociodemographic details, qualitative data on reasons for consultation and the patient's causal models of their illness and a closed question on the patient's attribution of whether the illness affected the mind/soul or body ('do you feel that your illness is one of your body, your mind/soul or both?').

#### *General Health Questionnaire* (*GHQ-12*)
The 12-item version of the GHQ has been previously used in India. It consists of questions which detect only cognitive and psychological symptoms; even the item on sleep loss specifies the cause as being due to worry (see Table 3). A study in general practice in India reported that a cut-off score of 1/2 provided the optimal balance of sensitivity (83%) and specificity (96%) for case detection (Shamasundar *et al.* 1986).

### Primary care Psychiatric Questionnaire (*PPQ*)

This questionnaire was developed in India. It is a 7-item questionnaire which was developed from a pool of items based on common presenting complaints of primary care attenders with a CMD. The rationale for developing the PPQ was that the low recognition of CMD by primary health workers was partly due to the somatic and non-specific nature of clinical presentations; since such symptoms were an 'easy mode of communication' of psychiatric distress, the 'somatically' orientated physician could elicit such symptoms without the additional effort of probing for emotional symptoms (Srinivasan & Suresh, 1990). Only one item is cognitive, viz. forgetfulness; one item deals with the inability to work as before while the remaining items are somatic (see Table 4). Validation studies showed that a cut-off score of 2/3 had the optimal balance of sensitivity (88%) and specificity (60%) (Suresh *et al.* 1993).

### The Revised Clinical Interview Schedule (*CISR*)

The CISR is a structured interview for the measurement of CMD in community and primary care settings (Lewis *et al.* 1992). It consists of 14 key areas tapping different groups of symptoms of CMD, e.g. depression, anxiety, worry, fatigue, sleep problems, panic and phobias. The sum of the key area scores generates a total score (range 0–57), which is a measure of non-psychotic psychiatric morbidity; scores of 12 or more indicate caseness. The Konkani version of the CISR was prepared in the following steps: the interview was first translated into Konkani by two translators, one a bilingual psychiatrist (J.P.) and the other a professional translator. The two versions were then given to two individuals (a bilingual clinical psychologist and a professional translator) for backtranslation. The two versions were then compared and in a meeting involving all translators, a consensus version developed. This version included many items for which two possible translations were available. The CISR was then piloted with psychiatric out-patients and with community recruits to determine whether items were understood and were tapping

the same concepts as the English version. The Konkani CISR was further revised on the basis of these pilot studies.

### Health care provider diagnosis

For each subject recruited, the PHC physician was asked to complete a diagnostic sheet which recorded the primary diagnosis and whether there was any psychological problem.

### Interview procedure

Each subject was interviewed by two interviewers who were blind to each other's ratings; one interviewer interviewed the subject with the GHQ, PPQ and EMI while the other interview consisted of the CISR. The order of the two interviews was randomly assigned.

### Data analysis

Three sets of case criteria were considered. The etic or biomedical case criterion was the score of the CISR: subjects who scored 12 or more were classified as biomedical cases. The emic criterion was the patient's own assessment of the emotional nature of the illness; subjects who felt the illness affected their mind or soul were classified as emic cases. Psychologizers were defined as those subjects who were classified as biomedical cases who felt that their illness mainly affected their mind or soul; biomedical cases who perceived their illness to be purely a bodily affliction were classified as 'pure somatizers' while those who had mixed attributions were termed 'facultative somatizers' (Weich *et al.* 1995). The third case criterion was the diagnosis of the health care provider. The overall discriminating power of the GHQ-12 and PPQ was estimated by plotting ROC curves and computing the area under the curve against the case criteria. ROC curves are obtained by plotting sensitivity against the false positive rate for all possible cut-off scores of the interview (Mari & Williams, 1985). Validity coefficients of the GHQ-12 and PPQ were evaluated by estimating sensitivity and specificity at different cut-off scores against the biomedical criterion. All GHQ-12 and PPQ items were entered into logistic models together to determine which items of each questionnaire predicted caseness independently ($P < 0.05$). These items were disembedded from the data and new total scores generated; the discriminating power of these

shorter versions of the two questionnaires was then evaluated using ROC analysis. Comparisons of ROC areas under the curve were computed using ROC curve analyser, which estimates the probability that two curves encompass different areas. Percentage figures are rounded off to the nearest whole number.

## RESULTS

A total of 335 subjects were approached of whom 32 refused to enter the study; there was no difference in age or sex between refusers and the sample. Of the 303 subjects who entered the study: 210 were women (69%); 78% had not passed the 10th standard (O-level equivalent) examination; 58% of the subjects were not in any form of employment outside the home; and six subjects were in professional occupations (e.g. teacher). The mean age of the sample was 44·6 years (s.D. 14·3, range 16–65); 54% of subjects were Catholic while most of the remainder were Hindu (45%). With regard to marital status: 56% of subjects were married; 18·5% were single; and 23% were widowed.

According to biomedical criteria, 141 subjects (46·5%) were classified as cases. According to the emic criterion ($N = 266$; the rest gave a 'don't know' response), 98 subjects (37%) were classified as cases. Overall agreement between the two criteria was 64% (kappa 0·27, $P < 0·0001$). Unless otherwise specified, the term

'case' refers to the biomedical case criterion. ICD-10 diagnoses were generated using the PROQSY program; 18 cases received two diagnoses. The diagnostic frequencies were: mild depression (F32.0), 13 (4·2%); moderate depression (F32.1), 36 (11·8%); severe depression (F32.2), 10 (3·3%); mixed anxiety–depression (F41.2), 73 (24%); panic disorder (F41.0), 21 (6·9%); and phobic disorder (F40.0), 6 (1·9%).

Physicians recorded a diagnosis for 297 subjects. Psychological disorder was considered in 60 subjects; physicians were more likely to consider that the illness had an emotional or psychological component in the cases (35% $v.$ 11%; OR 3·1, 95% CI 1·6–6·2, $P < 0·001$).

### Presenting complaints

The commonest reasons for consultation were somatic symptoms including aches and pains, specific diagnostic categories such as hypertension and diabetes and other non-specific somatic complaints such as diarrhoea (see Table 1). Aches and pains and behavioural complaints were commoner among the cases. Psychological symptoms were rarely reasons for consultation.

Subjects used a range of causal models to explain their illness, the commonest being psychosocial (e.g. marital conflict, worries about alcoholism in the family: 22%), trauma related to accidents (10%), physical illness (8%) and heat or cold theories (6%). A quarter (28%) did not know what had caused their illness. Cases

Table 1. *Biomedically defined cases and non-cases: reasons for consultation at presentation*

| Complaints (up to three per subject)* | Cases ($N = 141$) $N$ (%) | Non-cases ($N = 162$) $N$ (%) | Comparison of cases and non-cases† OR (95% CI) |
|---|---|---|---|
| Somatic, e.g. wound dressing, dizziness, asthma, diarrhoea, fever | 139 (98) | 153 (94) | NS |
| Non-specific aches and pains | 83 (59) | 56 (35) | 2 (1·2–3·3) |
| Hypertension | 36 (25) | 41 (25) | NS |
| Diabetes mellitus | 17 (12) | 20 (12) | NS |
| Miscellaneous, e.g. fitness certificate, to take medicines | 14 (10) | 15 (9) | NS |
| Behavioural, e.g. tiredness, sleep problems | 21 (15) | 3 (2) | 9·2 (2·5–40) |
| Pins and needles | 8 (6) | 7 (4) | NS |
| Psychological, e.g. tension, nervousness | 4 (3) | 4 (2) | NS |

* Each subject could provide up to three reasons for consultation; reasons were coded *post-hoc* ensuring that the same coding category was not allowed more than once for any subject.
† Odds ratios are only presented for statistically significant differences ($P < 0·05$).

Table 2. *Association of illness attributions in cases of CMD with* (a) *chronicity and* (b) *recognition of psychological problem by PHC physician*

| Group | Illness duration > 1 month | | PHC physician recognition | |
|---|---|---|---|---|
| | Proportion % | OR | Proportion % | OR |
| Pure somatizers (N = 60) | 53 | 1 (reference) | 24 | (1 reference) |
| Facultative somatizers (N = 20) | 65 | 1·6 (0·6, 4·6) | 30 | 1·4 (0·5, 4·3) |
| Pure psychologizers (N = 43) | 81 | 3·8 (1·5, 9·6) | 48 | 2·8 (1·2, 6·6) |
| | | (Chi-square test for trends = 8·5, P = 0·003) | | (Chi-square test for trends = 5·9, P = 0·01) |

were more likely to consider a psychological cause (31 % *v.* 13 %; OR 3, 95 % CI 1·6–5·6, $P < 0·001$). On the closed question on illness attribution, cases were significantly more likely to consider that their illness involved their mind or soul (51 % *v.* 24 %; OR 3·2, 95 % CI 1·9–5·4, $P = 0·001$).

**Somatizers *versus* psychologizers**

Thirty-five per cent of subjects with a CMD were psychologizers (N = 43), 16 % were facultative somatizers (N = 20) and the remainder were pure somatizers (N = 60). The three groups of subjects showed a trend towards chronicity (illness duration > 1 month) and to being recognized as suffering from a psychological problem by the PHC physician from pure somatization to psychologization (Table 2).

Psychologizers and facultative somatizers were similar with regard to all socio-demographic variables and were grouped together (on the rationale that patients in both groups shared a psychological illness model) in comparisons with pure somatizers for these variables. Thus, subjects with a psychological attribution were more likely to be women (90 % *v.* 77 %; OR 2·8, 95 % CI 1–8·1, $P = 0·04$). There were no differences between the two groups on other demographic variables, namely age, unemployment, school completion and marital status. These subjects scored significantly higher on the CISR as compared to pure somatizers (mean 23·9, 22·1–25·6 *v.* 19·8, 18·1–21·5).

**Comparing the GHQ-12 and PPQ**

The ease of use of both questionnaires was evaluated on the basis of the experiences of five field research interviewers. The PPQ items did not pose any difficulties and were clearly under-

Table 3. *CMD discrimination by GHQ-12 and PPQ: analysis by ROC area under the curves (AUC)*

| | AUC | (S.E.) |
|---|---|---|
| **GHQ-12** | | |
| Biomedical criteria (N = 282) | 0·87 | (0·02) |
| Emic criteria (N = 250) | 0·67 | (0·03) |
| Health care provider diagnosis of psychological disorder (N = 278) | 0·64 | (0·03) |
| **PPQ** | | |
| Biomedical criteria (N = 303) | 0·77 | (0·02) |
| Emic criteria (N = 266) | 0·64 | (0·03) |
| Health care provider diagnosis of psychological disorder (N = 298) | 0·64 | (0·03) |

stood by patients; all 303 subjects were able to give clear responses to the seven items. However, some items from the GHQ-12 did pose difficulties; the item on 'difficulty making decisions' often confused subjects who enquired about what sort of decision the interviewer was asking about. Even after clarifications that the decisions involved were those one took as part of everyday living, six subjects were unable to give a clear answer. The item on 'ability to overcome difficulties' caused similar problems with the type of difficulty being referred to; once again despite clarifications, eight subjects were unable to answer this question. The item on 'ability to face up to problems' was confusing and could not be understood by four subjects. Other items also posed difficulties with one or two non-responses for most items, which accounts for the differing denominators in subsequent analyses. The ability of the GHQ-12 and the PPQ to discriminate CMD was compared on three sets of case criteria, using ROC area under the curves (see Table 3).

Table 4. *Logistic regression of all 12 GHQ items against outcome of caseness* (N = 282) (*adjusted for all variables shown*)

| GHQ item | OR | 95% CI |
|---|---|---|
| Ability to concentrate* | 5·2 | 2·2–12·1 |
| Lost sleep over worry | 2·5 | 1·2–5·2 |
| Played a useful part in things | 0·9 | 0·3–2·6 |
| Capable of making decisions* | 0·2 | 0·08–0·7 |
| Constantly under strain | 2·1 | 0·8–5 |
| Could overcome difficulties | 1·1 | 0·4–2·8 |
| Able to enjoy normal day to day activities | 3·2 | 1·3–7·4 |
| Able to face up to problems | 0·6 | 0·2–1·7 |
| Unhappy or depressed* | 4·4 | 2–9·9 |
| Losing confidence in oneself | 1·1 | 0·5–2·5 |
| Thinking of oneself as a worthless person* | 2·6 | 1·1–5·8 |
| Feeling reasonably happy, all things considered | 1·3 | 0·5–3·3 |

* Statistically significant, $P < 0.05$.

Table 5. *Logistic regression of all seven PPQ items against outcome of caseness* (N = 303) (*adjusted for all variables shown*)

| PPQ item | OR | 95% CI |
|---|---|---|
| Generalized aches and pains | 1 | 0·5–1·8 |
| Tiredness and fatigue* | 3·1 | 1·4–6·8 |
| Giddiness or dizziness | 1·4 | 0·8–2·5 |
| Feeling of bodily weakness | 1·1 | 0·4–2·4 |
| Inability to work as before | 1·8 | 0·8–4·1 |
| Sleeplessness* | 2·2 | 1·3–4·0 |
| Forgetfulness* | 2·9 | 1·7–5·2 |

* Statistically significant, $P < 0.05$.

Table 6. *Areas under the curves* (AUC) *for the shorter versions of both questionnaires* (GHQ5 *and* PPQ3) *were not statistically different from those of the original versions*

| | AUC (S.E.) |
|---|---|
| **GHQ5** | |
| Biomedical criteria (N = 299) | 0·88 (0·01) |
| Emic criteria (N = 263) | 0·68 (0·03) |
| Health care provider diagnosis of psychological disorder (N = 294) | 0·63 (0·03) |
| **PPQ3** | |
| Biomedical criteria (N = 303) | 0·76 (0·02) |
| Emic criteria (N = 266) | 0·64 (0·03) |
| Health care provider diagnosis of psychological disorder (N = 298) | 0·62 (0·03) |

The difference in areas covered by the GHQ-12 and the PPQ was statistically significant for the biomedical case criterion ($P = 0.002$) but not for the emic or health care provider criteria. Validity coefficients (against the biomedical case criterion) were computed for both questionnaires for cut-off scores. The optimal cut-off score for the GHQ-12 was 3/4 (sensitivity 87%; specificity 72%; misclassification rate 21%) or 4/5 (sensitivity 81%; specificity 79%; misclassification rate 21%). The optimal cut-off score of the PPQ was 3/4 (sensitivity 75%; specificity 62%; misclassification rate 32%). The GHQ-12 was superior to the PPQ in discriminating biomedical criterion cases irrespective of their somatic or psychological model of illness; for example, the ROC area under the curve for identifying cases in the group of pure somatizers was 0·88 (S.E. 0·02) for the GHQ-12 as compared with 0·76 (S.E. 0·03) for the PPQ, a difference in area which was statistically significant ($P = 0.003$).

**Developing shorter versions of the GHQ-12 and PPQ**

The items of each questionnaire were entered into a logistic model together (with biomedical caseness being the outcome). The results for each are presented in Tables 4 and 5. The five items of the GHQ-12, which were positively associated with caseness at a statistically significant level ($P < 0.05$), were used to generate a subscore ('GHQ5'). Similarly, the three items of the PPQ generated the PPQ-3 score. Both scores were then evaluated against biomedical and emic case criteria using ROC area under the curves (see Table 6). The areas under the curves for the shorter versions of both questionnaires were not statistically different from those of the original versions.

**DISCUSSION**

There has been considerable debate over the relative importance of somatic symptoms in CMD. This debate has influenced the question of the cross-cultural applicability of symptom profiles and psychiatric questionnaires. There is growing evidence that, if anything, somatic presentations are typical of CMD and it is psychological presentations which need further understanding (Kleinman & Kleinman, 1985). While some authors from low-income societies have suggested that the predominant presen-

tation of somatic symptoms and the ease with which these could be elicited pointed towards the likelihood that somatic symptoms were more accurate in identifying CMD (Ebigbo, 1982; Srinivasan & Suresh, 1990), this has not been systematically evaluated. The study described in this paper aimed to examine this question. The two screening questionnaires chosen for the study were selected on the ground that one (the GHQ-12) was an etic questionnaire and consisted mainly of cognitive items while the other (the PPQ) had been developed in India and consisted mainly of somatic items. In order to avoid biases introduced by selecting a case criterion based on a biomedical psychiatric model with an emphasis on psychological symptoms (as defined by a standardized psychiatric interview), we also used patient self-assessment and health care provider diagnosis as criteria of caseness. The definition of somatizers and psychologizers used in this study is not necessarily that used by other authors; thus, some authors define psychologizers as persons with a CMD who present with psychological complaints. Due to the small number of such persons in this study, this was not considered a practical definition. Thus, 'psychologizers' were those subjects with a biomedically defined CMD who had predominantly psychological attributions for their illness experience, 'pure somatizers' were those with predominantly somatic attributions and 'facultative somatizers' were those with mixed attributions.

This study has shown that although somatic symptoms are the commonest form of presentation in PHC attenders with a CMD, this does not imply that patients were unaware of the emotional contexts of their illness. Indeed, more than half the patients who were classified as cases on the basis of a psychiatric interview considered that their illness involved their mind/soul. 'Somatization' defined as a process which involves the attribution of a psychological illness only to a somatic origin was, therefore, encountered in less than half the subjects. These findings are consistent with reports from other low-income countries (Araya *et al.* 1994; Patel *et al.* 1995). The findings that psychologizers were more likely to be women and to suffer chronic illness and that somatic presentations were not related to education or occupational status suggest that psychological 'sophistication' with

its implicit assumptions of higher education is unlikely to be related to somatization in this population. Instead, it is possible that as illnesses became chronic patients, in particular women, re-evaluated the context of their distress. The findings that psychologizers had higher morbidity scores and that there was a trend for subjects with psychological illness models to be recognized by the PHC physician confirm one of the study hypotheses and are remarkably similar to findings from developed countries (Weich *et al.* 1995). Thus, patient models of CMD may naturally evolve from a somatic to a psychological one as the illness becomes chronic and severe and it is these clinical characteristics which make the CMD more likely to be detected by the health care provider. This is arguably a fortuitous and sensible clinical situation since up to half of all cases of CMD recover without specific intervention and the most consistent predictors of poor outcome are chronicity and severity of illness (Mann *et al.* 1981; Patel *et al.* 1997*a*). Prospective research is needed to evaluate whether somatic and psychological models are simply temporally related presentations of the same distress syndrome (i.e. somatic models of illness evolve to psychological models if the CMD becomes chronic) or represent different groups of patients as implied by the category of somatoform disorders. Another topic for research is whether recognition by PHC physicians has a differential impact on outcome in patients with somatic and psychological models of illness.

The GHQ, which is an etic questionnaire for this population, performed better than the PPQ on the etic criterion of psychiatric caseness. Thus, cognitive and psychological symptoms are superior to somatic symptoms in discriminating CMD in this population. This finding is consistent with the item content of questionnaires developed *de novo* from patient idioms, such as the Shona Symptom Questionnaire in Zimbabwe, which have found that cognitive symptoms are superior to somatic symptoms in the detection of CMD (Patel *et al.* 1997*b*). One possible reason for this is the fact that many of the somatic symptoms typically associated with such illness in Euro-American cultures may not have the same diagnostic sensitivity in this setting due to the relatively greater prevalence of chronic medical conditions which present with

similar symptoms (e.g. loss of appetite) (Ohaeri & Odejide, 1994). Another reason could be related to the bias introduced by the fact that the biomedical case criterion is based on cognitive symptoms itself; however, the GHQ-12 was as good as the PPQ on the emic and health care provider criteria and this comparability was sustained even for the subgroup of pure somatizers. On balance, therefore, the etic questionnaire is superior for screening for CMD to the indigenous one. This finding goes against the second hypothesis of this study and is clearly an unexpected one. It suggests that the core symptoms of CMD are more universally alike than dissimilar and that irrespective of the model of illness used by the patient, a psychological symptom questionnaire performs at least as well (and against the biomedical criterion, significantly better) than a somatic symptom questionnaire. While the PPQ had a clear advantage in terms of its ease of comprehension as reflected by the fact that all seven items were understood by all patients (in contrast to the GHQ-12), this advantage of the potential improvement in facilitating communication between PHC physician and patient was not accompanied by a comparable advantage in its discriminating ability. Therefore, we would recommend the use of a questionnaire with emphasis on cognitive items, such as the GHQ-12, for use as a screening questionnaire in this population.

The validity coefficients of the GHQ-12 revealed a higher cut-off score for optimal sensitivity and specificity than other studies from India and studies with Asians in the UK which reported cut-off scores of 1/2 or 2/3 (Shamasundar *et al.* 1986; Jacob *et al.* 1997). Variable cut-off scores for screening questionnaires in different cultures have been commonly reported. For example, the Self-Reporting Questionnaire (Harding *et al.* 1980), which is widely used in low-income countries, was found to have a higher cut-off score in African countries (Kortmann, 1990; Patel & Todd, 1996); similarly, the GHQ-12 has been found to be influenced by cultural factors in South American settings leading to higher cut-off scores (Lewis & Araya, 1995). This reaffirms the need to evaluate the validity of screening questionnaires as an essential prerequisite of any study using them in a new population. An analysis to determine which items of summative questionnaires help predict mental disorder has two potential uses: first, it allows research in a setting different from the one in which the questionnaire was developed to evaluate which items are independently predictive of mental disorder; and second, it has the potential of reducing the length of the questionnaire and thus making it more suitable for screening large populations or as a clinical tool. The discriminating ability of the shortened 5-item version of the GHQ was at least as good as the full version, suggesting that it could be used as an alternative to the 12-item version. Shamasundar *et al.* (1986) used discriminatory analysis to examine which items from the GHQ-12 predicted CMD and identified five items of which three overlap with the findings of this study, i.e. sleep loss, the ability to enjoy day to day activities and feeling unhappy or depressed. This may indicate that these three symptoms are the most crucial to identifying cases; indeed, the three items alone were found to perform comparable to the full 12-item version against both biomedical criteria (ROC AUC 0·85) and emic criteria (ROC AUC 0·69). The finding that just three items perform as well as 12 suggests that evaluating screening questionnaires in this manner may bring down the number of questions for detecting probable cases to a level which even the busiest PHC staff find acceptable. The short versions of the GHQ need to be evaluated in different populations in order to judge the representativeness of the findings of this study.

## CONCLUSION

This study suggests that patients with CMD who hold somatic models of illness tend to suffer an illness that is relatively acute and mild; thus, psychological models may occur as a result of a re-evaluation of patient explanatory models as the illness becomes more chronic and severe. This, in turn, is linked to higher levels of recognition by the PHC physician. This association may be of clinical importance since chronicity and severity of CMD are associated with poor outcomes. The GHQ-12, which consists of psychological and cognitive symptoms, was more accurate than the PPQ, an indigenous measure consisting of somatic symptoms, for discriminating CMD irrespective

of the illness model held by the patient. Thus, cognitive symptoms are superior to somatic symptoms for the detection of CMD in primary care attenders in this population. Despite this superiority, the cut-off score of the GHQ-12 for case identification was higher than that commonly used in other settings reaffirming the need to evaluate the validity coefficients and cut-off scores whenever a screening questionnaire is used in a setting which is different from the one in which it was originally developed. Shorter versions of the GHQ performed as well as the 12-item version and may have the practical advantage of being simpler to use and easier to incorporate into busy primary care settings.

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