

BRIEF COMMUNICATION

## The Validation of the 12-item General Health Questionnaire among ethnic Indian women living in the United Kingdom

K. S. JACOB,<sup>1</sup> D. BHUGRA AND A. H. MANN

*Institute of Psychiatry, London*

### ABSTRACT

**Background.** The General Health Questionnaire (GHQ) has been validated in different languages and cultures and in diverse settings. However, the validity of the 12-item version, increasingly used for screening for psychiatric morbidity in primary care, has not been established among ethnic Indians living in the United Kingdom.

**Methods.** The GHQ-12 was used to screen for psychiatric morbidity in a study of patterns of consultation and explanatory models of mental illness in a general practice in West London. All individuals who scored 2 or more and an equal number of individuals who scored 0 or 1 were interviewed using the Revised Clinical Interview Schedule (CIS-R) to confirm psychiatric morbidity. Hindi versions of the both these instruments were also employed. Thresholds of GHQ were compared against the standard of the CIS-R using the recommended threshold of 12 and above as indicating caseness. A receiver operator characteristic curve was drawn to obtain the best threshold value for screening.

**Results.** The optimal threshold for screening as assessed by receiver operator characteristic analysis was 2/3. This threshold had a sensitivity of 96.7% and a specificity of 90%.

**Conclusions.** The sensitivity and specificity of the 12-item General Health Questionnaire among women of ethnic Indian origin living in the United Kingdom is high. It can be employed as a screening instrument to identify individuals with psychiatric morbidity in this population.

### INTRODUCTION

The 28- and 30-item General Health Questionnaires (GHQ) (Goldberg, 1972) have been validated in different languages and cultures and in diverse settings (Goldberg & Williams, 1988) including India in Kannada (Shamsunder *et al.* 1986) and in Hindi (Gautam *et al.* 1987). This paper examines the validity of the 12-item version, increasingly used for screening for psychiatric morbidity in primary care, among ethnic Indians living in the United Kingdom.

### METHOD

The GHQ-12 was used to screen for psychiatric morbidity in a study of patterns of consultation and explanatory models of mental illness in a general practice in West London. It was estimated that 70% of the total number of patients registered with the practice were of ethnic Indian origin. A consecutive sample of patients who satisfied the following criteria were recruited: women aged over 16 years, of ethnic Indian origin (Indian subcontinent), resident in the catchment area for one year and conversant in English or Hindi. Individuals with the following characteristics were excluded: a diagnosis of schizophrenia, chronic psychoses, organic men-

<sup>1</sup> Address for correspondence: Dr, K. S. Jacob, Section of Epidemiology and General Practice, Institute of Psychiatry, Denmark Hill, London SE5 8AF.

tal disorders, mental retardation, or the presence of severe language or hearing disability.

The patients were allowed to choose the language for the questionnaire and the subsequent standard interview (English or Hindi). Patients who consented were administered the GHQ-12. The Hindi version of the GHQ standardized in India was employed (Gautam *et al.* 1987). A threshold of 1/2 was chosen initially to screen for psychiatric morbidity. All patients who scored above this threshold and an equal number of individuals who scored 0 or 1 were interviewed using the Revised Clinical Interview Schedule (CIS-R) (Lewis *et al.* 1992) to confirm psychiatric morbidity. The Hindi version of the CIS-R, employed in the 4th National Survey of Ethnic Minorities, was used (Policy Studies Institute, 1994).

Thresholds of GHQ were compared against the standard of the CIS-R using the recommended threshold of 12 and above as indicating caseness. A receiver operator characteristic curve was drawn to obtain the best threshold value for screening.

## RESULTS

Forty-eight GHQ positives (score 2 or more) and 52 GHQ negatives (score 0 or 1) were interviewed using the CIS-R. The study sample had a mean age of 43.2 (s.d. 13.4) years. The majority had been or were married (93%), were housewives (64%), had received formal education (82%), were first generation migrants (89%) and followed the Sikh or Hindu faiths (76%).

Fifty-four individuals chose Hindi as the language for the interview while 46 preferred English. The choice of language for the interview was not significantly associated with CIS score or the presence of psychiatric morbidity (CIS-R case or International Classification of Diseases-10 diagnosis (WHO, 1992)). However, the choice of English was significantly associated with being a second generation migrant ( $\chi^2 = 8.7$ ;  $df = 1$ ;  $P = 0.003$ ), younger age ( $t = 6.01$ ;  $df = 98$ ;  $P = 0.000$ ), being single ( $\chi^2 = 8.8$ ;  $df = 1$ ;  $P = 0.003$ ) and having received formal education ( $\chi^2 = 18.7$ ;  $df = 1$ ;  $P = 0.000$ ).

Thirty (30%) individuals met psychiatric case criteria using the CIS-R threshold of 12. The sensitivity and specificity values are shown in

Table 1. Sensitivity and specificity for different GHQ thresholds against CIS-R standard

| Threshold | Sensitivity (%) | Specificity (%) |
|-----------|-----------------|-----------------|
| 0/1       | 100.0           | 60.0            |
| 1/2       | 100.0           | 74.3            |
| 2/3       | 96.7            | 90.0            |
| 3/4       | 80.0            | 92.9            |
| 4/5       | 66.7            | 98.6            |
| 5/6       | 50.0            | 98.6            |
| 6/7       | 40.0            | 98.6            |
| 7/8       | 23.3            | 100.0           |
| 8/9       | 20.0            | 100.0           |
| 9/10      | 13.3            | 100.0           |
| 10/11     | 6.7             | 100.0           |
| 11/12     | 0.0             | 100.0           |

Table 1. The area under the ROC curve was found to be 0.9690. The optimal threshold for screening was found to be 2/3. This threshold had a positive predictive value was 80.6% and a negative predictive value 98.4%. The sensitivity and specificity of the 2/3 threshold for individuals who spoke Hindi was 94.1% and 91.7% respectively. The values for individuals who chose English were similar (sensitivity 100%, specificity 88.2%).

## DISCUSSION

There have been seven validity studies of the 12-item GHQ (Tennant, 1977; Banks, 1983; Radavanovic & Eric, 1983; Mari & Williams, 1985; Shamsunder *et al.* 1986; Bellantuono *et al.* 1987; Piccinelli *et al.* 1993). The median values for sensitivity is 86% (range 71–91%) while the specificity is 80% (range 71–93%). Thresholds of 1/2 and 2/3 have been suggested as the modal values when the results of all studies were summarized (Goldberg & Williams, 1988).

The results of this study among ethnic Indians living in the United Kingdom documents high sensitivity and specificity for the GHQ-12. It also suggests that the threshold of 2/3 is more efficient for screening. The 1/2 threshold had lower specificity and a higher false positive rate. It is interesting to note that similar sensitivity and specificity values were obtained when the results were analysed separately for Hindi and for English speaking individuals. The 2/3 threshold is recommended for obtaining samples

of respondents with a high likelihood of being cases.

This study was funded by The Wellcome Trust. Dr K. S. Jacob is a Wellcome Overseas Fellow.

## REFERENCES

- Banks, M. H. (1983). Validation of the General Health Questionnaire in a young community sample. *Psychological Medicine* **13**, 349–353.
- Bellantuono, C., Fiorio, R., Zanotelli, R. & Tansella, M. (1987). Psychiatric screening in a general practice in Italy: a validity study of the GHQ. *Social Psychiatry* **22**, 113–117.
- Gautam, S., Nijhawan, M. & Kamal, P. (1987). Standardization of Hindi version of Goldberg's General Health Questionnaire. *Indian Journal of Psychiatry* **29**, 63–66.
- Goldberg, D. P. (1972). *The Detection of Psychiatric Illness by Questionnaire*. Maudsley Monograph No. 21 Oxford University Press: Oxford.
- Goldberg, D. & Williams, P. (1988). *A User's Guide to the General Health Questionnaire*. NFER-Nelson: Windsor.
- Lewis, G., Pelosi, A., Araya, R. & Dunn, G. (1992). Measuring psychiatric disorder in the community: a standardized assessment for use by lay interviewers. *Psychological Medicine* **22**, 465–486.
- Mari, J. J. & Williams, P. (1985). A comparison of the validity of two psychiatric questionnaires (GHQ-12 and, SRQ-20), in Brazil, using, ROC analysis. *Psychological Medicine* **15**, 651–659.
- Piccinelli, M., Bisoffi, G., Bon, M. G., Cunico, L. & Tansella, M. (1993). Validity and test-retest reliability of the Italian version of the 12-item General Health Questionnaire in general practice: a comparison between three scoring methods. *Comprehensive Psychiatry* **34**, 198–205.
- Policy Studies Institute (1994). *The 4th National Survey of Ethnic Minorities*. Policy Studies Institute: London.
- Radovanovic, Z. & Eric, L. J. (1983). Validity of the General Health Questionnaire in a Yugoslav student population. *Psychological Medicine* **13**, 205–207.
- Shamsunder, C., Murthy, S. K., Prakash, O., Prabhakar, N. & Subbakrishna, D. K. (1986). Psychiatric morbidity in a general practice in an Indian city. *British Medical Journal* **292**, 1713–1715.
- Tennant, C. (1977). The General Health Questionnaire: a valid index of psychological impairment in Australian populations. *Medical Journal of Australia* **12**, 392–394.
- World Health Organization (1992). *International Classification of Diseases-10: Clinical Descriptions and Diagnostic Guidelines*. WHO: Geneva.