

Psychiatric screening in general practice: comparison of the general health questionnaire and the hospital anxiety depression scale

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SUMMARY. *The prevalence of psychiatric disorder in 100 patients attending their general practitioner was found to be 33% based on the criteria of the DSM-3 diagnostic system. Using the DSM-3 diagnosis as a yardstick, the performance of the hospital anxiety depression scale was compared with that of the general health questionnaire. Relative operating coefficient analysis showed good discrimination between 'cases' and 'non-cases' for both questionnaires, and the optimum threshold score was found to be eight for the hospital anxiety depression scale and five for the general health questionnaire. Using these threshold scores the positive predictive value was 81% for the hospital anxiety depression scale and 77% for the general health questionnaire. The hospital anxiety depression scale appeared more sensitive than the general health questionnaire (90% versus 77%) and simpler to complete. In addition, it does not require a different threshold score for each population studied. The use of screening questionnaires in general practice is discussed.*

Introduction

PSYCHIATRIC illness is often hard to diagnose in the presence of physical disorder.¹ Symptoms of anxiety and depression often accompany physical disease and consequently a psychiatric diagnosis can be missed. Effective screening would be useful for epidemiological research and in everyday clinical practice. The general health questionnaire is a popular screening tool but has some limitations; the elderly find it difficult to complete and it has a bias towards physical symptoms.^{2,3} The 30-item version of the general health questionnaire places least emphasis on somatic symptoms but still has a low specificity with the physically ill.⁴ The hospital anxiety depression scale consists of seven questions about anxiety and depression.⁵ The authors claim it is unaffected by physical illness and it could be of value in the community, where anxiety and depression are common.

In this study the prevalence of psychiatric illness in general practice was estimated using a psychiatric research interview⁶ developed for the diagnostic system described in the third edition of the American Psychiatric Association's *Diagnostic and statistical manual* (DSM-3),⁷ which is now gaining worldwide popularity. Using the DSM-3 diagnosis as a yardstick the validity of the hospital anxiety depression scale as a screening tool for psychiatric illness was compared with that of the general health questionnaire.

Relative operating coefficient curves

Psychiatric questionnaires are usually compared in terms of sensitivity (the proportion of 'true cases' correctly identified) and specificity (the proportion of 'true normals' correctly identified). In order to do this a predetermined cut-off point or threshold score is used above which a 'case' is diagnosed. By raising the threshold score the sensitivity decreases and specificity increases. Using all possible cut-off points a curve can be plotted of sensitivity versus the false positive rate (the compliment of specificity). This relative operating coefficient curve is a representation of the ability of the instrument to distinguish between 'cases' and 'non-cases'.^{8,9} If the ability of the instrument is no better than chance a straight line would be produced and if greater than chance a curve above the diagonal would result. The area under the curve varies from 0.5 for no better than chance to 1.0 for a test with perfect discrimination. The ideal cut off point is the best compromise between high sensitivity and low false positive rate and this is represented on the curve as the furthest point from the diagonal.

Method

Over a five week period a one in five sample of patients attending a single practitioner in an urban practice were asked to complete the hospital anxiety depression scale and the 28-item general health questionnaire. Patients under 16 years of age were excluded. Blind to the results of the questionnaires the general practitioner conducted a normal consultation and also classified patients as having physical, psychological or mixed presentation. On the same day a psychiatric research interview was carried out using the structured clinical interview for DSM-3.

The questionnaires were compared using relative operating coefficient analysis.

Results

Of the 100 patients entered in the study three failed to complete the general health questionnaire; no difficulties were encountered with the hospital anxiety depression scale. There were 51 women and 49 men, 58 were married, the mean age was 37.4 years (standard deviation 17.4 years) and 24 were unemployed.

The total prevalence of psychiatric disorder according to DSM-3 criteria was 40%, but this included patients with phobic disorders (four patients) and adjustment (temporary mood) disorders (three). The prevalence of anxiety and depressive states was 33% — generalized anxiety disorder (nine patients), panic disorder (one), major depressive disorder (14) and dysthymia (nine).

Demographic features of the 40 cases and the 60 non-cases were compared. There were no significant differences in the mean age, the proportion married or the proportion unemployed. There were, however, significantly more widowed or divorced patients among the cases than the non-cases (six versus one; $P < 0.05$). Significantly more cases presented with psychiatric problems than non-cases ($P < 0.05$) while musculoskeletal presentations were significantly more common among non-cases ($P < 0.01$) (Table 1).

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Table 1. Presenting complaints of cases and non-cases.

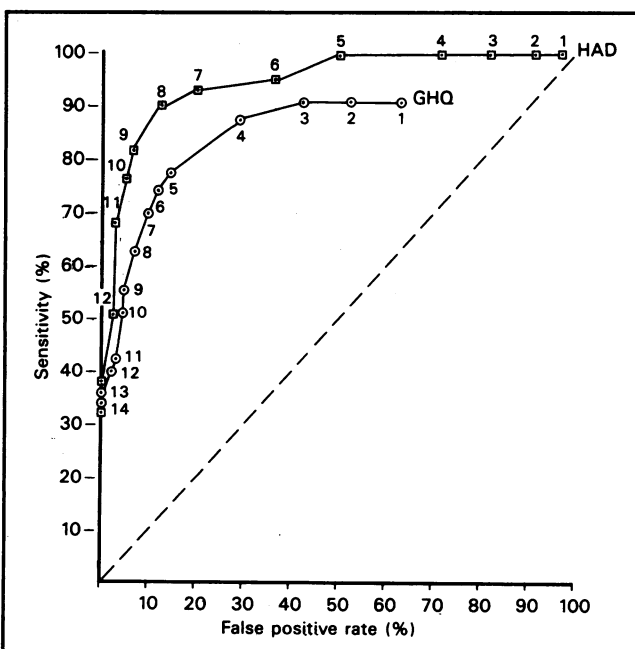
	Number of patients	
	Cases (n = 40)	Non-cases (n = 60)
Psychological	10	1
Respiratory	7	11
Musculoskeletal	6	18
Obstetric/contraception	5	5
Dermatological	4	8
Other	8	17

n = total number of patients.

Table 2. Comparison of the effectiveness of the general health questionnaire (GHQ), hospital anxiety depression scale (HAD) and general practitioner at screening for psychiatric disorder as defined by DSM-3 criteria.

	Positive predictive value (%)	Negative predictive value (%)	Specificity (%)	Sensitivity (%)
28-item GHQ	77	18	85	77
HAD	81	12	86	90
General practitioner	91	24	96	49

Relative operating coefficient curves were plotted using the results from the questionnaires (Figure 1). The curves are well above the diagonal, thus demonstrating that both questionnaires discriminate well between cases and non-cases as defined by DSM-3 criteria. The curve for the hospital anxiety depression scale is above that for the general health questionnaire and the area under the curve is larger (0.958 compared with 0.873). The cut-off point giving the best compromise between sensitivity and false positive rate, that is the point on the curve furthest away from the diagonal, is eight for the hospital anxiety depression scale and five for the general health questionnaire.

**Figure 1.** Relative operating coefficient curves for the hospital anxiety depression scale (HAD) and general health questionnaire (GHQ) with cut-off points indicated on the curves.

Using these optimal threshold scores the questionnaires can be compared with the general practitioner in all four areas of performance (Table 2). The positive predictive value is the probability of a case defined by the questionnaires or general practitioner being found a case by DSM-3 criteria and this was 77% and 81% for the general health questionnaire and hospital anxiety depression scale respectively. The negative predictive value is the probability of a non-case being found a non-case by DSM-3 criteria. The general practitioner showed greater agreement with the DSM-3 criteria when identifying a case than either of the questionnaires — 91% and 96% for the positive predictive value and specificity, respectively. However, he failed to diagnose half the cases later detected by the psychiatric research interview — sensitivity 49%. Therefore, the doctor missed many cases but was usually correct when identifying a patient as having a psychiatric problem. He revised his management of 11% of patients (28% of cases identified by DSM-3 criteria) when the questionnaire and interview results were revealed.

Discussion

According to Shepherd and Clare¹⁰ the prevalence of psychiatric disorder in a general practice population is between 10% and 20%. Using research diagnostic criteria Hooper¹¹ found the overall prevalence to be 11%. However, patients attending their general practitioner have a higher prevalence as demonstrated by Skuse and Williams¹² who found a prevalence of 34%.

General practitioners underdiagnose psychiatric illness and a third of all cases remain hidden. In addition, the diagnostic ability of doctors varies widely.^{1,12} Thus, there is need for an effective screening tool to uncover this hidden morbidity. The general health questionnaire is widely used but is only sensitive to changing symptoms and may not detect chronic illness. To avoid these problems Goldberg¹³ recommended two further questions about psychiatric history and psychotropic drug use.

Two recent studies have assessed the use of the general health questionnaire in primary care.^{14,15} Goldberg and Bridges¹⁴ estimated the prevalence of new psychiatric illness using the British ID-catego system and the American DSM-3 system. Of 2228 patients attending their general practitioner 82% agreed to complete the general health questionnaire. Unfortunately only a proportion of patients were interviewed by a psychiatrist and not always on the same day that they completed the questionnaire. The results were weighted to allow for these 'sampling fractions'. The prevalence of psychiatric disorder determined by DSM-3 and ID-catego criteria was 33% and 27% respectively. Using the DSM-3 criteria as a standard the general health questionnaire (cut-off point five) and the general practitioner were compared. The practitioner outperformed the general health questionnaire in terms of specificity but again missed many cases.

Wright and Perini¹⁵ examined a 10% random sample of general practice attenders aged between 17 and 65 years of whom 26% were diagnosed as having a psychiatric disorder by their general practitioner. All were asked to complete the 28-item general health questionnaire. The threshold score was revised after the study and a cut-off point of nine was found to be the best compromise between sensitivity and specificity.

Relative operating coefficient analysis was used by Bridges and Goldberg¹⁶ to validate the general health questionnaire with 100 neurology patients. Again the results had to be weighted as not all patients were interviewed but the relative operating coefficient curve was well above the diagonal. The area under the curve was 0.88 which was similar to this study but the threshold score was 11/12. The recommended threshold scores for the general health questionnaire vary from four to 17.⁴

This study avoids the problems of sampling fractions as the whole group completed a psychiatric research interview. It

confirms previous results which show that the general practitioner has a low detection rate, but rarely makes a false positive diagnosis. The hospital anxiety depression scale performed as well as, and at times better than the general health questionnaire in this study and performed similarly in a study in a clinic for inflammatory bowel disease,¹⁷ where the researchers showed that the optimal threshold score was also eight.

Psychiatric screening questionnaires appear to be suitable for use in everyday clinical practice. There is some doubt as to the nature of a true psychiatric case and in the community a general practitioner's diagnosis may be more relevant than, and will certainly differ from that of a consultant. There is indeed a difference between all diagnostic methods. The best working compromise appears to be the final diagnosis of the general practitioner when he takes into account the screening questionnaire result. Temporary mood disturbance can be differentiated by completing the questionnaire again one to two weeks later before prescribing medication.⁶

The hospital anxiety depression scale has advantages over the general health questionnaire because of its ease of completion and consistent threshold score. It is also simpler to administer and is available in many languages. The inexperienced general practitioner or those working in non-English speaking communities would find use of the hospital anxiety depression scale helpful before prescribing antidepressants. The hospital anxiety depression scale also has immense possibilities for well person screening and general practice research.

References

1. Goldberg D, Blackwell B. Psychiatric illness in general practice. *Br Med J* 1970; 1: 439-443.
2. Goldberg D. *Manual of the general health questionnaire*. Windsor: NFER, 1978.
3. Goldberg D. Use of the general health questionnaire in clinical work. *Br Med J* 1986; 293: 1188-1189.
4. Mayou R, Hawton M. Psychiatric illness in the general hospital. *Br J Psychiatry* 1986; 149: 172-190.
5. Zigmond A, Snaith R. The hospital anxiety depression scale. *Acta Psychiatr Scand* 1983; 67: 361-370.
6. Spitzer R. *A structured clinical interview for DSM III*. New York: New York State Institute, 1983.
7. American Psychiatric Association Committee of Nomenclature and Statistics. *Diagnostic and statistical manual of mental disorder*. 3rd edition (DSM-3). Washington DC: APA, 1980.
8. Mari J, Williams P. A comparison of the validity of two psychiatric questionnaires (GHQ-12 and SRQ-20) in Brazil using relative operation coefficient (ROC) analysis. *Psychol Med* 1985; 15: 651-659.
9. Erdreich L, Lee E. Use of relative operating character analysis in epidemiology. *Am J Epidemiol* 1981; 114: 649-662.
10. Shepherd M, Clare A. *Psychiatric illness in general practice*. Second edition. Oxford University Press, 1981.
11. Hoepfer E, Nycz C, Cleary P, et al. Estimated prevalence of RDC mental disorder in primary care. *Int J Mental Health* 1979; 8: 6-15.
12. Skuse D, Williams P. Screening for psychiatric disorder in general practice. *Psychol Med* 1984; 14: 365-377.
13. Goldberg D. The use of a screening questionnaire by family doctors. In: *Report of VII World Congress of Psychiatry Illness in General Practice*. London: Plenum, 1983.
14. Goldberg D, Bridges K. Screening for psychiatric illness in general practice: the general practitioner versus the screening questionnaire. *J R Coll Gen Pract* 1987; 37: 15-18.
15. Wright F, Perini A. Hidden psychiatric illness: use of the general health questionnaire in general practice. *J R Coll Gen Pract* 1987; 37: 164-167.
16. Bridges K, Goldberg D. The validation of the GHQ-28 and the use of the MMSE in neurological in-patients. *Br J Psychiatry* 1986; 148: 548-553.
17. Andrews H, Barczek P, Allan R. Psychiatric illness in patients with inflammatory bowel disease. *Gut* 1987; 12: 1600-1604.

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