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INCIDENCE OF PSYCHIATRIC ILLNESS AMONG HOSPITAL OUT-PATIENTS

AN APPLICATION OF THE CORNELL MEDICAL INDEX

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Description and Review

The "Cornell Medical Index Health Questionnaire" (C.M.I.) is a four-page self-administered inventory comprising 195 questions, which correspond closely to those usually asked in a comprehensive medical interview. There are two forms of the questionary—one for men, one for women—which are identical except for six questions in the genito-urinary section. The questions are phrased in informal language and to each the patient answers "Yes" or "No." The average time needed to complete the questionary is 10–20 minutes, and most patients find it a satisfying diversion while waiting for the doctor. The questionary is arranged into sections, as Table I shows.

TABLE I.—*Sectional Subdivision of C.M.I.*

Section	Questions Referring to	No. of Questions
A	Eyes and ears	9
B	Respiratory system	18
C	Cardiovascular system	13
D	Digestive tract	23
E	Musculo-skeletal system	8
F	Skin	7
G	Nervous system	18
H	Genito-urinary system	11
I	Fatigability	7
J	Frequency of illness	9
K	Miscellaneous diseases	15
L	Habits	6
	Mood and Feeling Patterns	
M	Inadequacy	12
N	Depression	6
O	Anxiety	9
P	Sensitivity	6
Q	Anger	9
R	Tension	9
	Total	195

The development of the C.M.I. is described by Brodman *et al.* (1949), who point out that their intention was to provide a quick and reliable method of obtaining the facts of the patient's medical history, at no expense to the physician's time. In a trial of the C.M.I. in 180 consecutive out-patients it collected most of the critical data obtained independently by the physician, and, in addition, it often gathered important material not recorded in the medical history. The patients were shown to answer the questions as accurately as they answered similar questions at interview. The C.M.I. was developed as an adjunct to, not as a substitute for, oral interview; it ensures that when the doctor sees a new patient he already has a good deal of information about him, and so is less likely to overlook important symptoms.

Brodman *et al.* (1952a) have also used the C.M.I. for evaluating emotional disturbances. They postulated that the severity of the disturbance might be susceptible of estimation either by appraisal of the responses to individual items in the questionary or by the application of scoring procedures to the data. They administered the C.M.I. to a large sample of out-patients of the New York Hospital, and found that it successfully picked out most of the patients regarded clinically as being emotionally disturbed, and was a valuable pointer to such disturbance in many other patients (Brodman *et al.*, 1952b). It was an interesting finding that, whereas physicians diagnosed emotional disturbance in their patients six times as frequently as surgeons did in theirs, scoring levels on the C.M.I. were similar for both groups.

In 1952 the *British Medical Journal* suggested that the utility of the C.M.I. in this country should be explored, particularly its ability to pick out "the anxious, the fearful, the inadequate, and the depressed." No such comprehensive investigation has yet been reported, though Leigh and Marley (1956) have used the C.M.I. to compare different groups of asthmatic patients.

The aims of the present investigation were: (1) to discover whether any relation existed between the patient's state of emotional health, and the number of positive responses to questions on the C.M.I. (2) If such relation could be demonstrated, to determine the most informative method of scoring the C.M.I. and to establish a critical score representing a boundary between "emotionally normal" and "emotionally ill," with minimum misclassification. (3) Should it prove possible thus to validate the C.M.I., to apply it to other out-patient groups with a view to assessing the amount of psychiatric disturbance among them.

Method

During an investigation into the incidence of psychiatric illness amongst out-patients attending a general non-teaching hospital (Dulwich Hospital, London), the C.M.I. was given to various groups of patients: (*a*) 100 consecutive new referrals to the medical clinics (785)*; (*b*) 100 consecutive new referrals to the surgical clinics (985)*; (*c*) 64 consecutive new referrals to the gynaecological clinics (749)*; (*d*) 50 patients who had attended the gynaecological clinics on more than six occasions; and (*e*) 30 consecutive new referrals to the physical medicine clinics (510)*.

*The figures in parentheses indicate the number of new patients seen in the particular clinic in the year of investigation.

In addition, completed questionaries were available from "normal" and "neurotic" groups. The normal group comprised 48 men and 56 women who worked at a large London store. The neurotic group included 46 men and 72 women who were attending psychiatric out-patient clinics of the Maudsley Hospital. Further details of these groups, with their total scores and scores for sections M to R on the C.M.I., are shown in Table II.

Results

Statistical comparison was made between the mean total of positive replies made by the neurotic and the normal group:

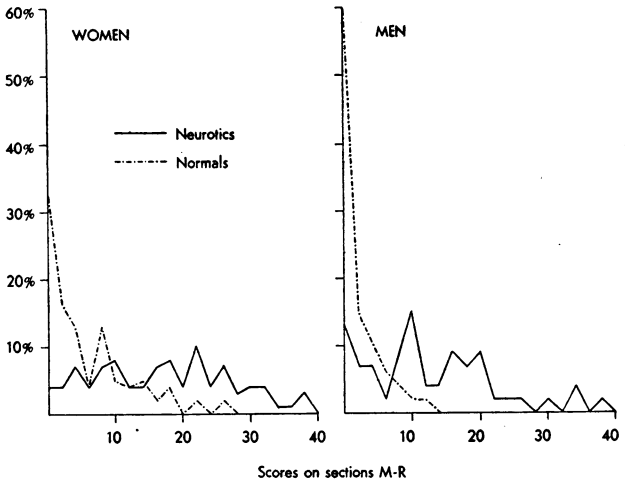
		Normal	Neurotic
Average total of positive responses	Males	11·0	32·5
	Females	20·8	45·6
For the sum of the M–R scores only	Males	2·8	14·1
	Females	6·9	18·4

These are all highly significant differences ($P>0.001$), showing that the scores could be used to separate these two groups of patients. In passing, we may remark that women tend to score higher than men and that neurotics score higher on areas A–L as well as on areas M–R. Thus the first aim of the present investigation—to discover whether the C.M.I. could discriminate between normal and emotionally disturbed patients—yielded positive results.

Our second objective—to determine a critical score representing the boundary between emotionally normal and emotionally ill—requires some elucidation. Clearly the C.M.I. does not yield perfect discrimination, but only greater or lesser proportions of misclassification. Where one draws the line depends on the purpose for which the test is used—that is, whether one is trying primarily to avoid misclassifying normals as neurotic, or neurotics as normal, or whether one is trying to reduce misclassification errors of both types to a minimum. Something also depends on the particular problem at hand, since the critical score is subject to various sampling fluctuations, and depends also on the subject's age and sex.

Brodman *et al.* (1956) suggest that "a medically significant emotional disturbance may be suspected when any of the following is evidenced on the C.M.I.: a syndrome of 'Yes' answers clinically suggestive of a psychological disorder; thirty or more 'Yes' responses in the entire C.M.I.; three or more 'Yes' responses in sections I and J; three or more 'Yes' responses on the last page of the C.M.I.†; or four or more questions not answered, answered both 'Yes' and 'No' or with changes or remarks written in by the patient." The phrase "may be suspected" clearly indicates an attempt to include all potential neurotics, at the risk of temporarily misclassifying a considerable number of normals. On the other hand, in a study of psychiatric incapacitation during Army training a critical score of 50 "Yes" responses in the entire inventory was found to yield the minimum amount of misclassification (Brodman *et al.*, 1954). Further research now in progress will throw light on the diagnostic features of each area in the C.M.I.

In the present study it was decided to concentrate on the six psychiatric areas M–R, and to try to establish first of all a critical score yielding minimum overall misclassification. The accompanying Chart shows the distribution of the M–R scores for normals and neurotics, for men and women. A score of 10 or more would yield the minimum amount of misclassification for both sexes, though clearly the precision of this discrimination leaves something to be desired. It is evident that by moving this critical score up or down one can "purify" one group at the cost of making the other group more "mixed" and increasing the total number of cases misclassified. This figure of 10 "Yes" responses differs widely from the figure of 3 "Yes" responses on areas M–R suggested by Brodman as "clinically suggestive of psychological disorder," probably because by lowering the critical score Brodman wanted to make sure that neurotic disorders would on no account be overlooked, even though quite a large proportion of normals may score between 3 and 9 "Yes" responses to areas M–R.



Distribution of M–R scores for men and women in the normal group and the neurotic group.

We may now ask what proportion of the patients in the medical, surgical, gynaecological, and physical medicine clinics showed evidence of psychiatric disturbance, as disclosed by the C.M.I. Table II shows the number of men and women in each clinic completing the C.M.I. On average, the clinic patients tended to be a few years older than the normal and the neurotic group, and this may to some extent account for the fact that the clinic cases had higher mean scores on the C.M.I. than the normal group. Mostly, however, they did not score as high as the group of neurotics. Gynaecological cases (both new and of longer standing) and those attending the physical medicine clinic tended to score a little higher than the others. While this is suggestive, it does not yet tell us what *proportion* in each clinic could be regarded as psychiatrically disturbed.

TABLE II.—*Mean Ages and Mean C.M.I. Scores of Various Groups of Out-patients*

Group	No. Completing C.M.I.		Mean Age		Mean Total Score		Mean M–R Score	
	M	F	M	F	M	F	M	F
Medical O.P.	34	61	45·2	45·6	21·4	32·4	3·9	8·6
Surgical ,,	26	55	49·9	42·5	20·4	31·2	3·9	9·5
Gynaecological O.P.:								
New cases	—	60	—	39·0	—	33·5	—	11·9
Old ,,	—	46	—	38·9	—	40·6	—	10·2
Physical medicine O.P.	10	14	49·6	49·6	36·7	33·2	9·4	11·4
Normals	48	56	36·9	34·5	11·0	20·8	2·8	6·9
Neurotics	46	72	33·9	34·9	32·5	45·6	14·1	18·4

†Areas M–R only.

TABLE III.—*C.M.I. Scores on Sections M–R for Different Groups of Out-patients*

	Medical		Surgical		Gynaecological		Physical Med.		Normals		Neurotics	
No. of cases:	M 34	F 61	M 26	F 55	New 60	Old 46	M 10	F 14	M 48	F 56	M 46	F 72
Score	%	%	%	%	%	%	%	%	%	%	%	%
0	40	14	28	7	7	14	20	7	34	9	9	1
1	18	5	20	7	7	4	—	15	24	9	4	3
2	3	3	4	9	5	2	10	7	4	14	—	—
3	9	2	15	5	5	7	—	—	6	12	8	—
4	6	7	9	5	8	2	10	7	8	4	—	4
5	—	8	—	5	3	4	—	7	6	7	2	3
6	3	7	—	5	3	7	10	—	4	5	4	4
7	—	2	—	7	5	4	—	—	4	2	—	1
8	3	8	4	4	2	4	—	7	2	2	2	3
9	3	8	4	5	3	2	10	7	—	11	4	4
10–14	3	16	16	11	15	24	10	15	8	11	25	15
15–19	9	13	—	16	15	10	10	—	—	7	15	15
20–24	3	5	—	4	12	7	20	7	—	5	15	19
25–29	—	—	—	4	2	7	—	14	—	2	4	14
30–34	—	—	—	2	5	2	—	7	—	—	2	8
35–39	—	2	—	4	3	—	—	—	—	—	4	6
40–44	—	—	—	—	—	—	—	—	—	—	2	—
10 and above	15%	36%	16%	41%	52%	50%	40%	43%	8%	25%	67%	77%
Mean score	3·9	8·6	3·9	9·5	11·9	10·2	9·4	11·4	2·8	6·9	14·1	18·4

For this we must turn to Table III. By applying the critical score of 10 to both sexes we observe the different percentages in each out-patient clinic group that could be considered to be emotionally disturbed. None of them scored as high as the neurotic groups nor as low as the normals of the same sex. Emotional disturbances were particularly frequent among the gynaecological groups, though no more so among patients of long standing than among new patients. Many physical medicine patients also scored highly, though the total number of cases was small. As before, women tended to score higher than men.

Discussion

What significance may be attached to these findings? First, let us point out that the C.M.I. is an uncommonly good discriminator, as paper-and-pencil tests go. Using the critical score of 10 and above, we have seen in Table III that only 8% of the normal men obtained such scores, against 67% of the male patients attending the Maudsley Hospital. For women, these proportions were 25% and 77% respectively. The C.M.I. score also correlated +0.56 with brief-interview psychiatric judgment, as obtained on 45 women attending a medical out-patient clinic. On the other hand, women tend to score a good deal higher than men even among the normal group, which suggests (*a*) that the test items as given have been selected with a bias towards female symptoms and complaints; or (*b*) that there is a "cultural" factor at work, which permits women to admit to a greater number of symptoms than men; or (*c*) that women on the whole really do have more emotional disturbances than men, even when they are not psychiatrically ill. Only further research can tell us which of these is the case. In addition, emotional disturbance due to the nature of the *physical* symptoms may account for some of the high scores, especially those among the gynaecological patients.

As yet the C.M.I. offers no way of distinguishing between patients who score high on sections M–R of the index because they are worried and upset by physical illness and those who are hysteric or hypochondriacal. Finally, as Table III shows, by moving the critical score different estimates of the proportion of emotionally disturbed patients would be obtained. At what point the C.M.I. evidence of emotional disturbance becomes equivalent to a diagnosis of neurosis or psychosis is difficult to say without further research. The four criterion groups of normal and neurotic men and women yielded only 20% and 24% misclassification, respectively, using a critical score of 10 and above.

Conclusions

The results of this pilot inquiry suggest clearly that the incidence of emotional disturbance among out-patients attending various clinics can be considerable. This is especially so among gynaecological patients, and also among physical medicine patients and among *women* attending surgical clinics. Psychiatric investigation of such patients would quite often seem necessary. The C.M.I. can be a most valuable instrument if used as a first diagnostic check, and further research now in progress will help to increase its usefulness and validity.

We are grateful to Dr. A. D. Leigh for completed questionaries of neurotic and normal groups; to consultants at Dulwich who allowed us to see their patients; and to Dr. Michael Shepherd, of the Institute of Psychiatry, Maudsley Hospital, who stimulated the study.

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More than 1,500 patients from the Federation of Nigeria receive treatment at Aro Hospital for Nervous Diseases each year, and the Western Nigerian Government, in whose region the hospital is located, is spending approximately £500,000 annually on the hospital's upkeep. The organization of the hospital is based on a "village system" similar to the "guild system" now operating in Belgium. Under the scheme, patients live with their relatives in surrounding villages. The recent acquisition of modern equipment is said to be yielding excellent results. (*Western Nigerian News*, WNG./132.)