

# A Multi-institutional Study of Depression in Family Practice

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Depression among outpatients of three descriptively and geographically dissimilar family practice residency programs was studied. The Beck Depression Inventory, the Popoff Index of Depression, and the Multiscore Depression Inventory (MDI) were compared. Reliabilities of all three instruments were high, as were correlations among the instruments. The only significant differences among the three populations were on the social introversion and sad mood subscales of the MDI. Regression analyses were then performed to compute equivalent scores on the Beck Depression Inventory short form from the MDI and Popoff instruments. This allowed approximate conversion of scores to the four levels of severity of depression described by Beck and Beck. This study provides the first extensive normative data for family practice on these measures, thus providing family physicians with a comparison group appropriate for a family practice rather than a psychiatric population.

Depression is one of the most common psychiatric diagnoses made by family physicians.<sup>1</sup> Research on depression in family practice has increased, along with greater awareness of the prevalence of depression and its symptoms.<sup>2</sup> Many studies on the diagnosis of depression in family practice have relied on self-report questionnaires as a measure of the patient's depression. However, some authors<sup>3</sup> seem to have regarded self-reported depression scores as indicating a diagnosis of depression, whereas all the commonly used instruments were intended primarily as a measure of *severity* of depression, not as a replacement for clinical diagnosis of the syndrome.<sup>4</sup> Only when self-report depression inventories are supplemented by a comprehensive structured interview can diagnosis of a depressive disorder be made. Self-report measures are more appropriately used as screening instruments or to provide a fuller pic-

ture of severity of symptomatology. A high score on any of the inventories does not, however, necessarily indicate a diagnosis of depression per se; the patients may report depressive symptomatology concomitant with anxiety disorder, organic brain syndrome, terminal illness, or schizophrenia. Nevertheless, when used appropriately, the self-report measures can both save time and provide a rich description of patients' symptom patterns. The current study discusses the strengths and weaknesses of several of the self-report measures used in family practice.

Previous studies on depression in family practice residency programs have typically used only one institution, limiting the confidence with which results can be applied to programs other than the one under study. This is particularly salient in family practice, where programs differ considerably in their emphasis, ranging from community-based hospitals (where family practice may be the only residency program) on the one hand, to urban-based programs, serving a very different patient population (where family practice may be in competition with many other residency pro-

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grams in the hospital), on the other. It would be presumptuous to assume, therefore, that results from one program would apply to another. In the present study, depression in the outpatient populations of three different family practice residency training program facilities was studied: a community-based suburban Chicago program, an urban Chicago program associated with a tertiary care facility, and a geographically dissimilar community-based program in Greenville, South Carolina.

The present study was designed to evaluate and compare, in the three quite different family practice populations, three self-report measures of depression: the short form of the Beck Depression Inventory,<sup>5</sup> the Popoff Index of Depression,<sup>6</sup> and the Multiscore Depression Inventory designed by Berndt, Petzel, and Berndt.<sup>7</sup> A few other measures that have been used with some frequency were not included. For example, the Zung Self-Rating Depression Scale<sup>8</sup> was omitted from the study. Family physicians frequently use the Zung scale (supplied free by a drug company), despite lack of convincing evidence for its validity or reliability.<sup>9</sup> More problematic, however, is the item content, as the Zung scale was derived verbatim from severely depressed psychiatric inpatients. These items have consequently been considered offensive by less severely disturbed individuals taking the questionnaire.<sup>10</sup>

Another commonly used instrument is the Minnesota Multiphasic Personality Inventory-Depression (MMPI-Depression) scale.<sup>11</sup> It, however, is somewhat deceptively named, as it does not actually provide a measure of depression. Rather, as early as 1957,<sup>12</sup> factor analytic studies had demonstrated that the 60-item scale included only five items relevant to depression. The largest single factor included items variously interpreted as measuring psychopathology, generalized discontent or dissatisfaction, or a willingness to admit personal inadequacies. Furthermore, the MMPI-Depression scale is typically administered with the entire MMPI, a procedure that takes nearly two hours of the patient's time. Correlations with other depression scales are low.<sup>9</sup>

The scales chosen for the current study were all felt to be particularly applicable to family practice populations. The short form of the Beck Depression Inventory (BDI) was developed in 1972 from the original inventory<sup>13</sup> and consists of 13 items with a multiple-choice format. It was designed for

use with general practice populations and appears to have adequate reliability and validity, although certain questions remain concerning the construct validity of the short form.<sup>14</sup>

In 1969 Popoff developed an Index of Depression, a 15-item questionnaire with a multiple-choice format of three answers for each item. It was based on statements most frequently made by patients with "masked" depression, with each item containing one such "covert" statement, one overtly depressed statement, and one "healthy" statement. The validity of this instrument has not been extensively evaluated, although it has been tested on a general practice population.<sup>15</sup> However, the Popoff Index of Depression (PID) also failed to recognize the distinction between diagnosing depression and measuring severity of depression.<sup>6</sup>

The Multiscore Depression Inventory (MDI) was initially developed to provide a reliable, valid, self-report measure of depression specifically for use with "normal" populations. Additionally, it provided a multidimensional approach for assessment of depression, rather than just a global score. It is a 118-item, true-false questionnaire, with separate scores for 10 subscales: sad mood, energy level, guilt, learned helplessness, pessimism, social introversion, irritability, instrumental helplessness, low self-esteem, and cognitive difficulty. Reliability and validity, using family practice and college student populations, proved very good, both for the full-scale inventory and for the MDI subscales.<sup>7,16-20</sup>

## Methods

The subjects were 200 outpatients at three family practice residency program facilities. Ages of the subjects ranged from 18 to 90 years, and there were 75 men and 125 women. Subjects were limited to consecutive consenting outpatients within each sample.

One hundred two subjects were from MacNeal Memorial Hospital, a suburban Chicago program. The MacNeal program was one of the earliest family practice residencies to be developed in Illinois and is based in a community hospital where family practice is the strongest residency program in the hospital. The ages of the subjects ranged from 18 to 90 years, with a mean age of 42.69 years. There were 59 percent female and 41 percent male patients, with most subjects from Hollingshead-Red-

Table 1. Mean Scores (and SD) for the Multiscore Depression Inventory and Subscales

Scale	Total Sample (n=200)	MacNeal (n=102)	Masonic (n=77)	Greenville (n=21)
Full scale	36.59 (24.27)	35.67 (23.98)	40.17 (25.24)	27.71 (19.88)
Learned helplessness	2.76 (2.63)	2.68 (2.69)	2.95 (2.59)	2.43 (2.54)
Pessimism	4.10 (3.48)	4.16 (3.55)	4.26 (3.49)	3.24 (3.05)
Guilt	3.66 (2.82)	3.58 (2.71)	3.92 (2.99)	3.05 (2.69)
Energy level	4.99 (4.33)	4.77 (4.10)	5.60 (4.51)	3.76 (4.54)
Self-esteem	2.58 (3.01)	2.53 (2.94)	2.83 (3.28)	1.91 (2.23)
Social introversion	3.94 (3.25)	3.53 (3.10)	4.83 (3.40)	2.57 (2.52)
Cognitive difficulty	4.27 (3.27)	4.09 (3.15)	4.58 (3.43)	3.95 (3.25)
Irritability	3.93 (3.45)	4.09 (3.59)	4.18 (3.51)	2.19 (1.75)
Sad mood	3.56 (3.47)	3.32 (3.50)	4.24 (3.46)	2.14 (2.87)
Instrumental helplessness	2.55 (2.81)	2.64 (2.89)	2.50 (2.78)	2.29 (2.65)

lich socioeconomic classes III and IV.<sup>21</sup> A further 77 subjects (66 percent female and 34 percent male) were from the Illinois Masonic Medical Center family practice program, an urban program serving a mobile population with a proportionately larger number of patients living in nontraditional families. The ages of these subjects ranged from 18 to 70 years, with a mean age of 29.18 years (13 years less than the mean age of the suburban sample), and represented a wider range of socioeconomic classes. Most of the subjects were from classes III and IV, but there were also a significant number from classes II and V.

In order to assess patients from a geographical different area, the remaining sample of subjects was drawn from the family practice program in Greenville, South Carolina. Like MacNeal (but unlike Illinois Masonic), the program is based in a community hospital where it is, again, the strongest residency training program in the hospital. The age range of this sample was from 18 to 68 years, with a mean age of 37.76 years and a sex ratio of 67 percent women to 33 percent men. The subjects were largely from socioeconomic classes II, III, and IV.

Subjects were asked to complete the three measures while waiting for their appointments. The instructions stated that the questionnaire was designed for research purposes only, that it was voluntary, and that confidentiality would be maintained. Names of the subjects were deleted and numbers were substituted to ensure anonymity. Data were then transferred to computer sheets for analysis.

## Results

Means on the three inventories were calculated for the total sample. The mean MDI score was 36.59 (SD = 24.27), the mean score on the Beck scale was 4.48 (SD = 5.32), and on the Popoff index, 7.12 (SD = 4.96).

Differences in scores between the three groups were analyzed using one-way analyses of variance with unequal *ns*. No significant differences were found between the three samples for the BDI, PID, MDI, or for eight of the 10 MDI subscales. Means for the MDI and subscales for each sample and for the total sample are shown in Table 1. Differences between samples were found, however, for social introversion,  $F(2,197) = 5.88$  ( $P < .01$ ), and for the sad mood subscale,  $F(2,197) = 3.60$  ( $P < .05$ ). Post-hoc Scheffé analyses using the .05 criterion revealed that for social introversion the MacNeal (mean = 3.53) and Greenville (mean = 2.57) samples did not significantly differ from each other; however, the urban Chicago subjects (mean = 4.83) reported significantly more social introversion than the other two samples. In addition, the urban sample reported significantly more sad mood (mean = 4.24) than the southern sample (mean = 2.14). However, there was no significant difference between the MacNeal sample (mean = 3.32) and either of the other two groups on this variable, as assessed by the Scheffé criterion.

Correlations between the three inventories were high, providing evidence that they are measuring approximately the same thing. The BDI cor-

related  $r(160) = .76$  with the MDI, and  $r(148) = .72$  with the Popoff index, while the MDI correlated  $r(148) = .77$  with the Popoff index. Missing data resulted in different numbers of subjects responding to each measure. All results were significant at  $P < .001$ .

Internal consistency reliabilities were computed for the three measures. The reliability of an instrument refers to its accuracy, just as the reliability of a laboratory test refers to its accuracy. The Multiscore Depression Inventory reliability was high,  $r = .97$ , with subscale reliabilities of  $r = .79$  for learned helplessness,  $r = .86$  for pessimism,  $r = .81$  for guilt,  $r = .92$  for energy level,  $r = .85$  for low self-esteem,  $r = .83$  for social introversion,  $r = .82$  for cognitive difficulty,  $r = .86$  for irritability,  $r = .85$  for instrumental helplessness, and  $r = .88$  for sad mood. For the Beck Depression Inventory, reliability was  $r = .88$ , and for the Popoff scale,  $r = .91$ . All reliabilities were significant at  $P < .001$ .

The MacNeal sample had previously been used in the initial evaluation of the MDI<sup>7</sup> to provide evidence for the criterion-related validity of the full scale and subscales. Ten patients out of the sample in that study were identified who had depression as a presenting complaint, and they were reported to have scored significantly higher on the MDI full scale and subscales than the other patients.

Finally, regression analyses were performed to allow prediction of BDI scores from scores on the MDI and the Popoff index. This analysis permitted comparison of scores from the Popoff index and the MDI with different levels of severity of depression as identified by Beck and Beck in 1972.<sup>5</sup> First, a regression analysis with the BDI as the dependent variable and the Popoff measure as the predictor documented that the Popoff index could significantly predict scores on the BDI,  $F(1,146) = 159.75$  ( $P < .001$ ). Utilizing the resulting regression weight of .76 and a constant of  $-1.05$ , one can infer that a score of 7 or below on the Popoff index was approximately equal to no or minimal depression on the BDI, a score between 8 and 11 appeared to be equivalent to mild depression, scores between 12 and 21 corresponded to moderate depression, and scores over 21 corresponded to severe depression as outlined by Beck and Beck.<sup>5</sup>

With the MDI as the predictor, the regression equation was also significant at  $P < .001$ ,  $F(1,158) = 217.91$ . Using the regression weight of .17 and a

**Table 2. Transformation of Multiscore Depression Inventory (MDI) and Popoff Scores to Equivalent Scores on the Beck Depression Inventory (BDI) and Corresponding Levels of Severity of Depression**

Severity of Depression	BDI (short form)	Popoff	MDI
None or minimal	0-4	0-7	0-35
Mild	5-7	8-11	36-52
Moderate	8-15	12-21	53-99
Severe	>16	>21	>99

constant of  $-1.49$ , a score of 35 or less on the MDI was approximately equivalent to no or minimal depression, scores between 36 and 52 corresponded to mild depression, scores between 53 and 99 were approximately equivalent to moderate depression, and scores over 99 corresponded to severe depression. The equivalent scores on the MDI, Popoff index and the BDI are shown in Table 2.

## Discussion

The three measures studied have demonstrated more than adequate reliability in measuring severity of depression in family practice populations. Results with all of the measures are likely to be representative of family practice populations in general, as practically no differences were found among the three samples studied (urban, suburban, and southern). Although more research has to be done to develop adequate norms for area, sex, and age, at least for these three instruments, tentative normative comparison groups are now available for family practice. For example, reference to Table 1 will show that a score by a patient of 61 on the MDI would indicate that the patient has greater severity of depression than 84 percent of family practice outpatients. Table 2 indicates that the same patient may be moderately depressed. It should be noted, however, that the 84 percent refers to family practice outpatients who are more depressed, on the average, than the general population.<sup>1,7</sup>

It appears that the three instruments are measuring the same construct, as shown by the high correlations between the instruments. All three of the instruments, therefore, would seem to be useful for studying family practice populations.

The Popoff index has been shown in the current study and others<sup>15</sup> to be appropriate for family practice patients, but more work needs to be done to establish further reliability and validity. The short form of the Beck measure<sup>5</sup> appears to be a quick, useful, and reliable screening device for depression. The BDI has been more extensively validated, but caution should be exercised in interpreting results. Problems such as taking items out of context when constructing the short form from the original inventory raise questions about its validity.<sup>14</sup>

Current results add to the growing evidence that the Multiscore Depression Inventory is a sound measure of severity of depression.<sup>7,16,17</sup> Furthermore, the MDI may have some advantage over the other instruments in that it differentiates well between low scores. Another virtue of the instrument is that it provides several symptom scores for different aspects of depression, all of which are reliable. A major drawback, however, is its length (20 minutes to complete). A short form of the MDI is available<sup>22</sup>; however, its properties have not as yet been sufficiently evaluated for clinical purposes. The MDI subscales<sup>18</sup> were designed to tap many common depressive symptoms: lack of energy, feelings of guilt, trouble with concentration and decision making, poor self-esteem, increased irritability, social withdrawal, a pessimistic attitude toward the future, predominating sad affect, and both instrumental and learned helplessness. Learned helplessness<sup>23</sup> refers to a passively helpless attitude toward life, while instrumental helplessness implies a somewhat more active attempt to elicit help or sympathy from others.

The value of the subscale scores for the clinician is currently being further evaluated, but it seems possible that the individual patients' scores on different subscales may have some clinical significance in understanding the etiology and phenomenology of depression. They may also be predictors of outcome, and intuitively it would seem that understanding the nature of the patient's depression would be helpful in planning the most appropriate therapeutic intervention for patients with different kinds of depression. Studies of the MDI with this in mind are currently in the planning stages.

In conclusion, the BDI, Popoff index, and MDI all appear to be useful tools for researching depression in family practice, and perhaps also for

clinical purposes. Choice of instrument may be influenced by need for brevity, availability of normative comparison groups, and desire for a greater information yield from the multiscore approach.

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