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Performance of four diagnostic approaches to depression in adults with cancer

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Abstract

Objective—The potentially confounding influence of somatic symptoms in identifying depression in medically ill patients has long been of concern, resulting in several proposed alternative diagnostic approaches. These approaches have been compared in the cancer setting, but the strengths and weaknesses of the alternative approaches have rarely been examined. The purpose of the current study was to examine the performance of four approaches to depression assessment among ambulatory cancer patients.

Method—Outpatients were recruited from a large cancer center (N = 611). Participants had to be 40 years or older, English-speaking, and have a cancer diagnosis. All participants completed a sociodemographic questionnaire and a modified Patient Health Questionnaire–9 with additional items targeting the Endicott and Cavanaugh substitutive criteria.

Results—Depression prevalence varied significantly by diagnostic approach, with the inclusive approach identifying the largest proportion as depressed (9.3%, n = 57), followed by the Endicott-substitutive (6.2%, n = 38), exclusive (4.6%, n = 28), and Cavanaugh-substitutive approach (1.8%, n = 11). Somatic items were significantly elevated across all four approaches.

Conclusions—The inclusive approach that retains use of somatic symptoms is appropriate when screening cancer patients for depression. The fact that somatic symptoms were more prevalent across approaches suggests that they may not inflate the prevalence of depression as much as some have feared. Rather, somatic items may explain variance in depressive symptoms beyond that explained by the presence of cancer and its treatment. Additionally, the Endicott items appeared useful for capturing depressive symptoms that are not included in the existing DSM criteria, and may have a place in clinical and research settings.

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1. Introduction

The presence of depressive symptoms in patients with cancer can have a significant impact not only on patient-reported outcomes such as quality of life, but also on variables such as pain, functional status, and mortality [1, 2]. The accurate diagnosis of depression in the context of medical illness, however, can be difficult due in part to significant symptom overlap. The potentially confounding influence of somatic symptoms in identifying depression in medically ill patients has long been a concern of researchers and clinicians, and has led to several proposed alternative diagnostic approaches [3–5]. Most researchers have summarized these alternative approaches as comprising four different strategies: the inclusive, exclusive, substitutive, and etiologic approaches [6]. These four approaches have different strengths and weaknesses, including variations in the sensitivity and specificity in identifying individuals with depression. Despite these studies recognizing potential diagnostic confounds, the debate continues over thirty years later in the cancer setting [7–11]. While individual settings may take for granted that one approach has been determined to be optimal, the literature is mixed at best and clear guidelines on which approach to use do not exist. Many cancer settings and psycho-oncology researchers, for example, continue to opt for screening measures that exclude somatic symptoms despite equivocal findings (i.e., the Hospital Anxiety and Depression Scale [5]; [11–13]), and the potential to “miss” patients with clinically significant depressive symptoms. The current study compares three of the most widely recognized approaches to depression assessment among medically ill patients, inclusive, exclusive, and substitutive, in a large sample of ambulatory cancer patients.

The pathophysiology of somatic symptoms among patients with cancer is often multiply determined [14]. For example, appetite disturbances, weight loss, and fatigue are some of the most common side effects of chemotherapy and radiation treatment, but these symptoms can also result from the nature and location of primary cancers and metastases (i.e., fatigue associated with hematologic malignancies and anemia). Sleep disturbances and diminished concentration often emerge in the context of steroid treatment, hormone treatment, and/or cancer-related pain [14]. Any of these symptoms and symptom clusters can also arise from inflammation and underlying cytokine activity associated with cancer and its treatment [15]. These are only a select few examples of how underlying organic processes can contribute to the expression of symptoms germane to affective disorders. Generally, however, research has shown that clinicians struggle to reliably determine the etiology of somatic symptoms when rendering a depression diagnosis [16]. Hence, debate continues even now regarding the optimal approach to depression assessment in oncology [7, 8, 10].

The *inclusive* approach counts all symptoms toward a diagnosis of depression, regardless of presumed etiology. This approach yields the highest sensitivity and inter-rater reliability, but leads to lower levels of specificity (because some symptoms may be attributable to medical

illness or medication side effects, rather than depression), and therefore may over-identify cases of depression. Given the sensitivity of this approach, it is often considered the most appropriate method for screening in clinical settings [17]. In contrast, the *exclusive* approach typically entails eliminating two of the "somatic" symptoms of depression, diminished appetite/weight loss and fatigue, reducing the number of criterion symptoms in the diagnostic manual [18] from nine to seven [17]. This approach tends to increase specificity but compromises sensitivity, identifying fewer patients as depressed [19, 20]. Hence, the exclusive approach may result in some patients who could benefit from treatment failing to receive services. On the other hand, the high specificity associated with this approach may make it more desirable for research settings, particularly when identifying a "pure" sample of patients with depression is paramount. Whether the exclusive approach really accomplishes this goal, however, is less clear. Several studies of depressive symptoms in chronically ill medical patients found that cognitive and affective symptoms were no more valid as indicators of depression than were somatic symptoms such as changes in weight or appetite and sleep disturbance [21, 22].

A third approach to diagnosing depression in medically ill patients involves replacing the somatic symptoms of depression with symptoms that are not included in the current diagnostic manual. One of the most widely cited *substitutive* approaches to diagnosing depression was proposed by Endicott [4], who recommended replacing four of the symptoms most commonly confounded by medical illness (fatigue, diminished appetite, sleep disturbance, and diminished concentration) with four alternative symptoms: tearfulness or depressed appearance in face or body posture; social withdrawal or decreased talkativeness; brooding, self-pity or pessimism; and cannot be cheered up, doesn't smile, no response to good news or funny situations. Although these symptoms were initially proposed because of their presumptive face validity, several studies have examined their impact (described below). Cavanaugh [3] also recommended a substitutive approach specifically for medical settings, but only proposed two replacement symptoms for the four somatic symptoms deleted: not participating in medical treatment despite the ability to do so and functioning at a lower level than the medical condition warrants or failure to progress in recovery despite improved medical condition. Although widely cited, no published research was identified that has systematically evaluated this proposal. Only one study evaluated their utility and found that they had a good ability to identify patients with cancer who had moderately severe major depressive disorder [7], while others either utilized the criteria as part of their diagnostic interview for depression among patients with cancer [23], or proponed them as a viable alternative approach for use in oncology [24].

Several studies have examined the relative utility of these alternative approaches in a range of medical settings, including medical inpatients [25], primary care [26], and general medicine, cardiology, and neurology [27, 28]. These studies have been inconclusive, however, and the findings may not generalize to oncology settings given the diversity of patients and settings in which the criteria have been examined. When specifically applied to patients with cancer, a handful of studies have found the inclusive and Endicott substitutive approaches to be identical [29–31]. For example, in a sample of 130 cancer patients receiving inpatient palliative care, Chochinov et al. [29] found identical rates of depression when comparing the symptom criteria used in the DSM-III-R [32] and Endicott's criteria

(9.0%, n = 12). In contrast, Ciaramella and Poli [33] administered the SCID [34] and Endicott criteria to a sample of 100 cancer patients at an outpatient treatment center and found that the prevalence of depression decreased from 49% to 29% when somatic items on the SCID were replaced with Endicott's criteria. Overall, these studies demonstrate comparability in diagnostic overlap of the inclusive and substitutive approaches, with one study suggesting lower prevalence when substituting somatic items. Across studies, the authors suggested that additional research is warranted in order to determine the clinical superiority of one system over another.

Despite the publication of inconclusive evidence dating back to over a decade ago, and a recent focus on distress and depression screening in the cancer setting [35, 36], research on optimizing approaches to depression assessment among patients with cancer has remained relatively untouched since the aforementioned studies. Debate continues regarding best practices, with many medical settings continuing to opt for depression screening measures that are based on the exclusive approach (e.g., HADS [5] and the Geriatric Depression Scale [37]). Whether or not this means that patients with significant depressive symptoms are being "missed" due to inappropriate normalization of physical symptoms as separate from depression remains unknown.

Despite these studies, two questions remain: which diagnostic method optimizes accuracy while minimizing the risk of false negatives (i.e., failure to identify patients with significant depressive symptoms) and should some (or all) of the somatic items be eliminated from consideration in this setting? A number of methodological confounds limit previous analyses of the substitutive criteria including small sample sizes and reliance on DSM diagnostic criteria to assess classification accuracy. This approach creates a circularity, in which existing diagnostic criteria are used to "validate" diagnoses based on these same criteria. The current study compared the prevalence of MDD using four different diagnostic approaches (inclusive, exclusive, substitutive-Endicott, and substitutive-Cavanaugh) in a large sample of ambulatory cancer patients. Additionally, item-level statistics for somatic items were examined to better understand their prevalence and relative contribution to the likelihood of rendering a depression diagnosis.

2. Method

2.1 Procedure

Participants were recruited from outpatient clinics at XXXX. To be eligible for participation, patients had to be 40 years or older, fluent in English, and have a cancer diagnosis. Patients were excluded if, in the judgment of research personnel, they exhibited severe psychopathology or cognitive impairment that would interfere with their ability to participate in the study. Patients were approached by trained research personnel while awaiting routine clinic appointments; those who were eligible were informed of the study procedures, risks and benefits, and invited to participate. The study was approved by the XXXX and XXXX Institutional Review Boards.

2.2 Measures

All participants completed the Patient Health Questionnaire-9 (PHQ-9 [38]), along questions assessing the four Endicott criteria and the two Cavanaugh criteria. Both the Endicott and Cavanaugh criteria were modified to use the same scale (0–3) and response format as the PHQ-9; both resulted in adequate internal consistency (Cronbach's α = .86 and .68 for the four Endicott items and two Cavanaugh items, respectively). The PHQ-9 was selected as the most appropriate measure for the current study aims given its approximation to the DSM criteria for depression. The overall modified PHQ-9 (i.e., with the addition of the six substitutive criteria) demonstrated good internal consistency even with the addition of the substitutive criteria (Cronbach's α = .92), suggesting that these additional items are measuring an underlying depression construct, and that these items can be administered successfully in self-report format. Additional sociodemographic and medical data were collected using a self-report questionnaire.

PHQ-9 items were considered present if they were rated as a 2 or 3. For all four approaches, the "diagnosis" of MDD required the endorsement of at least one gateway symptom as at least moderate severity and four or more additional symptoms. The inclusive approach was operationalized as the sum of all PHQ-9 symptoms endorsed with a score of 2 or 3. The exclusive approach eliminated two somatic symptoms of the PHQ-9 (diminished appetite/weight loss and fatigue), reducing the number of possible criterion symptoms from 9 to 7. The Endicott substitutive approach eliminated four somatic items (sleep disturbance, diminished appetite/weight loss, low energy, and trouble concentrating) and replaced them with the four Endicott criteria. The Cavanaugh substitutive approach also eliminated the same four somatic items but replaced these with the two Cavanaugh criteria, again reducing the number of criterion symptoms from 9 to 7.

2.3 Statistical Analyses

The presence of depression for the PHQ-9, Endicott, and Cavanaugh criteria could not be calculated for 7.8% (n = 52) of participants because of missing items. Thus, these participants were eliminated and the final sample size was 611 participants.

The prevalence of MDD was calculated for each diagnostic approach. Pearson product-moment correlation coefficients (r) were calculated between all items. The relationship between the presence of depression and self-rated health status was examined with the Chi-square test of association and corresponding Cramer's V values for each diagnostic approach. The Chi-square test was also used to determine whether or not differences in prevalence across the four approaches were significant; the Phi coefficient is reported as an indicator of the magnitude of these associations. Agreement between diagnostic approaches was determined using the Kappa (κ) statistic following the guidelines proposed by Landis and Koch [39] to guide the interpretation of Kappa coefficients. All item means were reported as well as effect sizes (i.e., Cohen's d) between depressed and non-depressed participants are presented for all items within each diagnostic approach.

3. Results

3.1 Participant Characteristics

The sample (N = 611) was approximately evenly split by gender (52.0% male; n = 318) and ranged in age from 40 to 90 years or older[1] (M = 64.9, SD = 10.21; Table 1). Most participants were white (87.1%; n = 532), married or living with a partner (70.7%; n = 432) and had a college and/or graduate education (68.9%; n = 421). The most common cancer diagnoses were gynecological (16.2%; n = 99), lung (14.9%; n = 91), and prostate (13.9%; n = 85). Approximately one third reported stage 4 disease (37.0%; n = 226). The majority of participants had received active cancer treatment within the preceding six months (71.0%; n = 434). Nearly one quarter of the sample reported past treatment for depression (23.4%; n = 143), and 16.0% (n = 98) reported current depression treatment (i.e., 5.0% were receiving individual psychotherapy alone, n = 31; 7.2% were receiving medication alone, n = 44; 3.3% were receiving both psychotherapy and medication, n = 20).

3.2 Diagnostic Approach Comparisons

All items were significantly correlated with one another, with Pearson's r ranging from .21 to .75 (Table 2). Fifty-seven participants (9.3%) met criteria for MDD according to the inclusive approach and according to the exclusive approach, 4.6% (n = 28) met criteria for MDD. The Endicott substitutive approach yielded a 6.2% (n = 38) prevalence of MDD while only 1.8% (n = 11) of participants were classified as having MDD according to the substitutive Cavanaugh approach.. Across each of the four approaches, poorer self-rated health status was associated with a significantly greater likelihood of being categorized as depressed (i.e., Cramer's V ranged from .24 to .35).

The inclusive and Endicott substitutive approaches both identified significantly more patients as having MDD than the exclusive approach (Table 3). However, the Endicott substitutive approach classified fewer participants as depressed than the inclusive approach. The Cavanaugh substitutive approach identified significantly fewer participants as depressed than any of the other three approaches. Despite differences in overall prevalence rates, kappa coefficients (κ) indicated substantial agreement between several of the diagnostic approaches to MDD (Table 3). The Cavanaugh substitutive approach diverged the most from the others, with fair to moderate agreement with the other approaches.

3.3 Item-level analyses

Item means and effect sizes between items for each diagnostic approach are listed in Table 4. Overall, the lowest mean scores were for the two Cavanaugh criteria and suicidal ideation items. ANOVAs indicated that those participants classified as having MDD reported significantly higher elevations on all items, including each of the four somatic items. This pattern was true for each diagnostic approach, including those that omitted somatic items from the diagnostic algorithm. For example, even for the exclusive approach, there were large effect sizes for somatic symptoms appetite disturbances (Cohen's d = 1.80) and low energy (Cohen's d = 1.67).

[1]Due to HIPPA protection participants who were 90 years or older (n = 2) checked a box indicating they were in this age range.

4. Discussion

The current study demonstrated the differential prevalence in depression diagnoses between four alternative diagnostic approaches in a sample of patients from across the cancer continuum. A major strength of the current study is the large and heterogeneous sample, thus increasing the reliability of the prevalence estimates observed. This study also demonstrated that the PHQ-9 can be successfully modified to include self-reported substitutive symptoms (i.e. as evidenced by good internal consistency), which may be of interest to researchers and clinicians depending on the needs of their setting. The inclusive approach yielded the highest prevalence of MDD (9.3%), which is not surprising given that it is the most lenient, incorporating the four somatic symptoms that could be the result of cancer or its treatment. The exclusive approach, which eliminates two somatic items, generated a lower prevalence of MDD across groups, classifying only 4.7% of participants and as having MDD. This pattern of results is also consistent with past research and the obvious implications of eliminating somatic items from consideration when assessing depression.

Of particular relevance to this study, however, was the impact of the Endicott and Cavanaugh substitutive approaches. Utilizing the Endicott criteria in place of the four somatic symptoms of depression, 6.2% of participants were classified as depressed. Given that this approach is most similar the inclusive approach, both of which utilize nine items, the 33% decrease in MDD prevalence (from 9.3% to 6.2%) is notable. The Cavanaugh approach, however, classified far fewer participants as having MDD (1.8%), even when compared to the exclusive approach (which also utilized only seven criteria). Thus, the elimination of somatic items substantially decreased the rate of MDD observed, even when controlling for the number of symptom criteria.

Thus, a major concern with implementing the Cavanaugh approach is that in eliminating all four somatic items from consideration and adding only two substitutive items, the number of possible criterion symptoms are reduced from nine to seven. Importantly, there was moderate agreement with the exclusive approach (i.e., $\kappa = .49$), which is the only other that also uses seven criterion symptoms. Therefore, the significantly lower prevalence of depression according to the Cavanaugh criteria may simply reflect increased specificity of the approach relative to others. Additionally, this sample was recruited from outpatient clinics. Thus, these were likely patients who tended to be adherent to treatment and follow-up appointments and therefore would not necessarily be expected to endorse Cavanaugh's "I am not participating in my medical care in spite of my ability to do so." This inference is supported by the fact that, other than suicidal ideation, the lowest mean item endorsement for the total sample was for the Cavanaugh criteria. A reasonable compromise may be to alter the Cavanaugh approach so that, like Endicott's, it includes nine criterion symptoms. Alternatively, the "best approach" may include the items from both substitutive approaches. Clinically, the findings suggest that settings would be grossly increasing their risk of missing a significant number of patients with significant depressive symptoms and that this approach therefore should not be used as a stand-alone screening procedure.

Despite variation in the prevalence of MDD across these diagnostic approaches, there was significant agreement between approaches with the exception of the Cavanaugh criteria.

Although the inclusive and Endicott substitutive approaches had significant diagnostic agreement, 21 participants who were classified as depressed according to the inclusive approach were not identified as depressed according to substitutive criteria. This divergence may represent the potential over-inclusivity of the inclusive approach, given its reliance on somatic symptoms. On the other hand, it reiterates what past depression researchers have theorized: that the Endicott substitutive approach may be a more accurate approach in the medically ill. However, it may be more appropriate as an adjunctive approach rather than as a replacement for an inclusive approach. For example, clinicians and researchers might opt to expand their standard clinical interview when evaluating depression among patients with cancer to include the Endicott criteria, while also "counting" somatic items towards their diagnostic assessment. This approach would provide additional rich clinical data and would allow clinicians to evaluate the relative "weight" of affective, cognitive, and somatic concerns presented by the patient. As described, settings must decide which is more important to them, sensitivity or specificity.

Elimination of just two somatic items without replacement (i.e., the exclusive approach), resulted in a 50% (n = 29) reduction in participants classified as depressed (compared to the inclusive approach). The addition of Endicott substitutive items, however, decreased the "loss" from eliminating somatic items, as 12 participants identified as depressed by the Endicott approach that were not identified by the exclusive approach. Thus, while the exclusive approach may be more specific, like the Cavanaugh approach, it increases the likelihood of overlooking significant depressive symptoms and is not recommended for regular use in clinical oncology practice.

Finally, regardless of diagnostic approach, worse self-rated health status was associated with a significantly greater likelihood of being categorized as depressed. There were also large effect sizes for somatic items among those participants that were categorized as depressed across all diagnostic approaches. Even those participants who met criteria for MDD according to the exclusive approach had significant elevations in the somatic symptoms that had been eliminated from the diagnostic criteria. Given the cross-sectional design of this research study, it is not possible to determine whether or not the somatic items reflect symptoms of an underlying depression or if those with a higher physical symptom burden are more likely to be depressed; the relationship is likely bi-directional. Regardless, the fact that these somatic symptoms were more prevalent across approaches suggests that they may not inflate the prevalence of depression as much as some have feared. Instead, it may be that these items explain variance in symptoms above and beyond that explained by the presence of cancer and its treatment and are indeed reliable indicators of depression even in cancer. These findings echo previous conclusions drawn by Mitchell and colleagues [21], in which they found that somatic items were among the most accurate diagnostic symptoms in a longitudinal study of patients with cancer. It is also possible that those individuals who are depressed experience and/or think about their physical symptoms differently, such that they may be more salient to depressed versus non-depressed patients. This phenomenon has certainly been established in the depression and pain literature [40, 41], and is equally plausible in the current study. Despite the limitations of cross-sectional study, however, the relationship of depression with somatic symptoms suggests that an inclusive approach will likely capture the largest number of patients who are experiencing significant depressive

symptoms. Thus, although the approach might prove overly inclusive for research settings, for clinical settings it will have appropriate sensitivity for capturing patients who warrant further clinical interview.

Limitations and Future Directions

Despite the important distinctions between diagnostic approaches identified here, there are some limitations to interpretability. First, our sample was predominately White and college-educated. Participants were also physically well enough to receive their care as ambulatory outpatients, and those who were more critically ill are not represented in this sample. Thus, the generalizability of the results is limited. Future studies should include a more racially and ethnically diverse sample in order to determine cultural variation in depressive symptom reporting. Additionally, the findings of the current study do not allow for a determination of classification accuracy, given the absence of a "gold standard" criterion measure such as an expert clinician interview. The substitutive criteria were also administered in self-report format, not embedded in a clinical interview, and therefore, the comparability of the observed symptom prevalences of this study to those conducted in the past may be limited; this is potentially the most problematic for the Cavanaugh criteria, which lend themselves most clearly to clinician-rating rather than self-report. Future studies should include expert clinician interviews as "validation" for depression diagnoses. Finally, the current study was limited by its cross-sectional design as the relationship between symptoms (i.e., both affective and somatic), antidepressant treatment, and symptom management/treatment response could not be determined. Repeated assessment of depressive symptoms over time would also allow for the determination of the reliability of the substitutive and the somatic symptoms and their predictive validity in the cancer setting.

Conclusions

Clinicians and researchers should determine the relative importance of a "missed" depression diagnosis in their patient population before establishing a screening and assessment procedure. For example, some approaches (i.e., inclusive) have better sensitivity for identifying depression, yet risk being overly inclusive. Approaches that emphasize specificity (i.e., exclusive) may risk overlooking minor or subsyndromal depression, even though such symptoms can often be clinically significant. At the diagnostic level, the Endicott items appeared useful for capturing symptoms that are not otherwise included in the existing DSM criteria. All substitutive approaches are not interchangeable, however, as evidenced by the very low prevalence of depression "caseness" captured by the Cavanaugh criteria. Although no specific statements about the sensitivity and specificity of each approach can be made in the absence of a reliable criterion measure, overall, these results appear consistent with past research indicating that the Endicott substitutive approach may represent a reasonable balance between over-inclusivity and over-exclusivity in the oncology setting. However, given the observed relationship between somatic items and depression, even in the exclusionary models, these results suggest that the somatic items remain an important part of the depression picture in patients with cancer, and therefore the inclusive approach does not necessarily inflate depression prevalence as much as some have feared. Therefore, sites who do utilize this approach will be more likely to reliably capture patients with significant symptoms than sites who utilize a substitutive or exclusive approach alone.

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Table 1

Demographic and Clinical Sample Characteristics (N=611)

		n	%
Age (M & SD)		64.9	10.21
Gender	Male	318	52.0
	Female	289	47.3
Race	White	532	87.1
	Black	32	5.2
	Asian or Pacific Islander	22	3.6
	Other	22	3.6
Ethnicity	Hispanic	52	8.5
	Not Hispanic	552	90.3
Marital Status	Single	42	6.9
	Married/Living with partner	432	70.7
	Divorced/Separated	86	14.1
	Widowed	51	8.3
Education	Did not graduate high school	26	4.2
	High school graduate/GED	68	11.1
	Partial college/vocational training	94	15.4
	College graduate	181	29.6
	Graduate degree/professional training	240	39.3
Treatment Status	Active treatment	434	71.0
	Off treatment	154	25.2
Disease Stage	In remission/not staged	27	4.4
	Stage 1	35	5.7
	Stage 2	37	6.1
	Stage 3	83	13.6
	Stage 4	226	37.0
Primary Cancer	Gynecological	99	16.2
	Lung/bronchus	91	14.9
	Prostate	85	13.9
	Colon/Rectum	49	8.0
	Bladder	43	7.0
	Kidney	43	6.1
	Pancreas	32	5.2
Past depression Treatment	Yes	143	23.4
	No	468	76.6
Current depression treatment	Yes	98	16.0
	No	513	84.0

Table 2

Pearson product-moment correlation coefficients (*r*) between all depression items

	PHQ									END				CAV	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**1**	**2**
PHQ-1	-														
PHQ-2	.75	-													
PHQ-3	.49	.47	-												
PHQ-4	.55	.52	.59	-											
PHQ-5	.51	.49	.46	.62	-										
PHQ-6	.54	.61	.33	.39	.37	-									
PHQ-7	.62	.60	.50	.52	.49	.52	-								
PHQ-8	.51	.46	.41	.45	.45	.43	.56	-							
PHQ-9	.39	.42	.25	.24	.25	.45	.40	.28	-						
END-1	.66	.63	.44	.49	.49	.56	.61	.56	.37	-					
END-2	.58	.69	.41	.41	.40	.53	.58	.43	.43	.60	-				
END-3	.60	.72	.38	.43	.41	.59	.52	.41	.51	.56	.66	-			
END-4	.60	.64	.36	.35	.36	.52	.53	.45	.51	.57	.63	.66	-		
CAV-1	.27	.31	.21	.26	.29	.34	.31	.28	.29	.34	.38	.35	.41	-	
CAV-2	.39	.46	.24	.29	.33	.50	.39	.37	.39	.46	.43	.46	.49	.50	-

Note: All items were significantly correlated ($p < .001$); END refers to the Endicott criteria; CAV refers to the Cavanaugh criteria.

Table 3

Agreement between depression diagnostic approaches

	Inclusive	Exclusive	Substitutive-Endicott	Substitutive-Cavanaugh
Inclusive		.64	.74	.30
Exclusive	.68		.78	.55
Substitutive-Endicott	.76	.79		.43
Substitutive-Cavanaugh	.42	.62	.53	

Note: Upper right cells are Kappa coefficients; Bottom left cells are Phi values.

Table 4

Item-level Effect Sizes (Cohen's d) for Depressed compared to Non-Depressed Participants

Item	Total Sample M(SD)	Inclusive	Exclusive	Substitutive Endicott	Substitutive Cavanaugh
PHQ-1: Little interest…	0.55(0.86)	2.99	2.89	3.03	2.20
PHQ-2: Feeling down…	0.50(0.77)	2.46	3.30	3.26	3.30
PHQ-3: Trouble falling or staying asleep…	0.95(1.03)	2.01	2.05	1.69	2.47
PHQ-4: Feeling tired or having little energy	1.12(1.01)	1.82	1.67	1.59	1.71
PHQ-5: Poor appetite…	0.69(0.97)	2.08	1.80	1.69	1.44
PHQ-6: Feeling bad about yourself…	0.33(0.70)	1.39	2.25	1.63	4.13
PHQ-7: Trouble concentrating	0.52(0.81)	2.34	3.33	2.10	3.02
PHQ-8: Moving or speaking so slowly…	0.31(0.70)	1.61	1.94	1.56	1.75
PHQ-9: Thoughts that you would be better off dead…	0.09(0.35)	0.86	1.09	0.98	1.30
END-1: Socially withdrawn…	0.37(0.75)	1.95	2.14	2.45	2.80
END-2: Tearfulness, had depressed appearance	0.32(0.68)	1.60	2.18	2.05	2.79
END-3: Brooding, self-pity…	0.39(0.72)	1.73	2.06	2.65	2.99
END-4: Could not be cheered up, didn't smile…	0.23(0.57)	1.67	2.08	2.09	2.38
CAV-1: I have not been participating in my medical treatment…	0.08(0.38)	0.62	0.81	0.81	1.50
CAV-2: I am functioning at a lower level than…	0.16(0.49)	0.99	1.32	1.25	5.00

Note: ANOVAs indicated that between group differences were statistically significant ($p < .001$) for all items within each of the four diagnostic approaches; END refers to the Endicott criteria; CAV refers to the Cavanaugh criteria.