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Evaluating the Centers for Disease Control's Empirical Chronic Fatigue Syndrome Case Definition

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The Centers for Disease Control and Prevention (CDC) recently developed an empirical case definition that specifies criteria and instruments to diagnose chronic fatigue syndrome (CFS) in order to bring more methodological rigor to the current CFS case definition. The present study investigated this new definition with 27 participants with a diagnosis of CFS and 37 participants with a diagnosis of a Major Depressive Disorder. Participants completed questionnaires measuring disability, fatigue, and symptoms. Findings indicated that 38% of those with a diagnosis of a Major Depressive Disorder were misclassified as having CFS using the new CDC definition. Given the CDC's stature and respect in the scientific world, this new definition might be widely used by investigators and clinicians. This might result in the erroneous inclusion of people with primary psychiatric conditions in CFS samples, with detrimental consequences for the interpretation of epidemiologic, etiologic, and treatment efficacy findings for people with CFS.

Keywords: *chronic fatigue syndrome; empirical case definition; Centers for Disease Control and Prevention; Fukuda criteria; Major Depressive Disorders*

Chronic fatigue syndrome (CFS) is a disabling chronic illness that has been defined by a consensus-based approach by Fukuda et al. (1994). This case definition specifies that individuals with this illness must have 6 or more months of chronic fatigue of new or definite onset, which is not substantially alleviated by rest, is not the result of ongoing exertion, and results in substantial reductions in occupational, social, and personal activities. In addition, to be diagnosed with this illness, individuals must have four or more symptoms (i.e., sore throat, lymph node pain, muscle pain, joint pain, postexertional malaise, headaches of a new or different type, memory and concentration difficulties, and unrefreshing sleep) that persist 6 or more months since onset. Although the Fukuda et al. case definition continues to be widely used, several articles have identified difficulties that this case definition continues to pose to clinicians and researchers (Jason, King, et al., 1999; Reeves et al., 2003). For example, the Fukuda et al. case definition did not specify which instruments to use and did not provide empirically derived cutoff points and scoring guidelines to diagnose CFS.

The Centers for Disease Control and Prevention (CDC) has now developed an empirical case definition for CFS that involves assessment of symptoms, disability, and fatigue (Reeves et al., 2005). The new CDC empirical case definition assesses disability using the *Medical Outcomes Survey Short-Form-36* (Ware, Snow, & Kosinski, 2000), assesses symptoms using the *Symptom Inventory* (Wagner et al., 2005), and assesses fatigue using the *Multidimensional Fatigue Inventory* (Smets, Garssen, Bonke, & DeHaes, 1995). The authors of this empirical case definition feel that the specification of instruments and cutoff points would result in a more reliable and valid approach for the assessment of CFS. Using these new criteria, the estimated rate of CFS has increased to 2.54% (Reeves et al., 2007), a rate that is about 10 times higher than prior CDC estimates (Reyes et al., 2003) and prevalence estimates of other

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investigators (Jason, Richman, et al., 1999). It is of interest that the new CFS rates are within the range of several mood disorders. Mood disorders are the most prevalent psychiatric disorders after anxiety disorders: For a major depressive episode, the 1-month prevalence is 2.2%, and lifetime prevalence is 5.8% (Regier, Boyd, & Burke, 1988). It is at least possible that the increases in the United States are due to a broadening of the case definition and possible inclusion of cases with primary psychiatric conditions. CFS and depression are two distinct disorders, however, even if they share a number of common symptoms. Including patients with a primary psychiatric illness in the current CFS case definition could confound the interpretation of epidemiologic and treatment studies. Major Depressive Disorder (MDD) is an example of a primary psychiatric disorder that has some overlapping symptoms with CFS.

Fatigue, sleep disturbances, and poor concentration occur in both depression and CFS. It is important to differentiate those with a principal diagnosis of MDD from those with CFS only. This is particularly important because it is possible that some patients with MDD also have chronic fatigue and four minor symptoms that can occur with depression (e.g., unrefreshing sleep, joint pain, muscle pain, and impairment in concentration). Fatigue and these four minor symptoms are also defining criteria for CFS. It is possible that using this broadened new CFS empirical case definition (Reeves et al., 2005), some patients with a primary affective disorder could be misdiagnosed as having CFS. Some CFS investigators would not see this as a problem because they believe that CFS is mainly a psychiatric disorder and that distinctions between the two phenomena are superficial and merely a matter of nomenclature. However, several CFS symptoms, including prolonged fatigue after physical exertion, night sweats, sore throats, and swollen lymph nodes, are not commonly found in depression. In addition, although fatigue is the principal feature of CFS, fatigue does not assume equal prominence in depression (Friedberg & Jason, 1998; Komaroff et al., 1996). Moreover, illness onset with CFS is often sudden, occurring over a few hours or days, whereas primary depression generally shows a more gradual onset. Individuals with CFS can also be differentiated from those with depression by recordings of skin temperature levels and electrodermal activity (Pazderka-Robinson, Morrison, & Flor-Henry, 2004). Hawk, Jason, and Torres-Harding (2006) used discriminant function analyses to identify variables that successfully differentiated patients with CFS, MDD, and controls. Using percentage of time fatigue was reported, postexertional malaise severity, unrefreshing sleep severity, confusion/disorientation severity, shortness of breath severity, and self-reproach to predict group membership, 100% were classified correctly. In summary, CFS and depression are two distinct disorders, although they share a number of common symptoms. It is possible to appropriately differentiate MDD from CFS if one uses appropriate measures.

It is still unclear whether the new empirical case definition of CFS (Reeves et al., 2005) has inappropriately included cases of purely affective disorders, such as MDD. This study evaluated whether the CDC empirical case definition distinguished between persons with MDD and persons with CFS. By assessing samples with MDD and CFS, we hoped to clarify whether the CDC empirical case definition has been able to successfully differentiate those with MDD from those with CFS.

Method

Participants

We recruited a total of 64 individuals, 27 with CFS and 37 with MDD. We obtained our sample of participants with CFS from two sources: local CFS support groups in Chicago and a previous research study conducted at DePaul University. To be included in the study, participants were required to have been diagnosed with CFS, using the Fukuda et al. (1994) diagnostic criteria, by a certified physician and were required to currently meet CFS criteria using the Fukuda et al. criteria. We excluded individuals who had other current psychiatric conditions in addition to major depression or who reported having untreated medical illnesses (e.g., diabetes, anemia).

We solicited 37 participants with a diagnosis of MDD to participate in this study. We found participants from three sources: local chapters of the Depression and Bipolar Support Alliance group in Chicago; Craigslist, a free local classified ads forum that is community moderated; and online depression support groups. To be included in the study, all participants were required to have been diagnosed with MDD by a licensed psychologist or psychiatrist. We excluded individuals who had other current psychiatric conditions in addition to MDD (e.g., bipolar, schizophrenia) and those who reported having untreated medical illnesses.

Participants who met criteria completed questionnaires that are described below. Participants reported any previous physical and mental illnesses and the date of diagnosis as well as current medications being taken to ensure that no other illness could account for the fatigue. We carefully screened participants to ensure that participants from the MDD group did not have CFS as defined by the Fukuda et al. (1994) criteria.

Measures

Demographic variables. We collected basic demographic variables that included age, ethnicity, marital status, occupation, gender, work status, and educational level.

The Medical Outcomes Survey Short-Form-36. This 36-item instrument is composed of multi-item scales that assess functional impairment in eight areas: limits in physical activities (Physical Function), limits in one's usual role activities due to physical health (Role Physical), limits in one's usual role activities due to emotional health (Role Emotional), Bodily Pain, general health perceptions (General Health), vitality (Energy and Fatigue), Social Function, and General Mental Health (Ware et al., 2000). Scores in each area reflect ability to function, and higher values indicate better functioning. Reliability and validity studies have demonstrated high reliability and validity in a wide variety of patient populations for this instrument (Stewart, Greenfield, Hays, et al., 1989). Based on the CDC empirical case definition (Reeves et al., 2005), the *Medical Outcomes Survey Short-Form-36* was used to assess disability (Wagner et al., 2005). According to Reeves et al. (2005), significant reductions in occupational, educational, social, or recreational activities were defined as scores lower than the 25th percentile on Physical Function (less than or equal to 70), *or* Role Physical function (less than or equal to 50), *or* Social Function (less than or equal to 75), *or* Role Emotional function (less than or equal to 66.7). A person would meet the disability criterion for the empirical CFS case definition by showing impairment in only one or more of these four areas (Reeves et al., 2005).

The CDC Symptom Inventory. The *CDC Symptom Inventory* assesses information about the presence, frequency, and intensity of 19 fatigue-related symptoms during the past 1 month (Wagner et al., 2005). All 8 of the critical Fukuda et al. (1994) symptoms were included as well as 11 other symptoms (e.g., diarrhea, fever, sleeping problems, and nausea). For each of the 8 Fukuda et al. symptoms, participants were asked to report the frequency (1 = *a little of the time*, 2 = *some of the time*, 3 = *most of the time*, 4 = *all of the time*) and severity (the ratings were transformed to the following scale: .08 = *very mild*, 1.6 = *mild*, 2.4 = *moderate*, 3.2 = *severe*, 4 = *very severe*; see Note 1). The frequency and severity scores were multiplied for each of the 8 critical Fukuda et al. symptoms and were then summed. Participants having 4 or more symptoms and scoring greater than or equal to 25 would meet symptom criteria on this instrument according to the CDC empirical case definition (Reeves et al., 2005).

The Multidimensional Fatigue Inventory. This instrument is a 20-item self-report instrument consisting of five scales: General Fatigue, Physical Fatigue, Reduced Activity, Reduced Motivation, and Mental Fatigue (Smets et al., 1995). Each scale contains four items rated from 1 to 5, with the scale score of 1 meaning *yes, that is true* and the scale score of 5 meaning *no, that is not true.* Reeves et al. (2005) used the *Multidimensional Fatigue Inventory* to measure severe fatigue, and to do this, they used only two of the five subscales: General Fatigue and Reduced Activity. Using the CDC empirical case definition standards, severe fatigue was defined as greater than or equal to 13 on General Fatigue *or* less than or equal to 10 on Reduced Activity.

Results

Classification by CDC Empirical Case Definition Criteria

When using the CDC empirical case definition to classify people with CFS, all 27 participants in the CFS-recruited group met criteria for CFS. However, 14 additional individuals from the MDD group also met the new CDC criteria for CFS. That is, 38% of those with a professional diagnosis of major depression were misclassified as having CFS using the CDC empirical case definition.

Sociodemographic Variables

Participants were separated into three groups: Those 27 diagnosed with CFS prior to this study and who met the new empirical CDC case definition of CFS, those 14 from the group with MDD meeting the new empirical CDC case definition of CFS criteria (MDD/CFS), and those 23 from the group with MDD not meeting the new empirical CDC criteria for CFS (MDD). Sociodemographic data were compared across all three groups of participants using Pearson's χ^2 and analysis of variance (ANOVA; see Table 1). Findings indicated a significant age effect, $F(2, 63) = 3.25$, $p < .05$. The average age for the CFS group was significantly older than the MDD/CFS group. Furthermore, there were also significant differences in regard to work status between groups, $\chi^2(6, N = 64) = 13.92$, $p < .05$. More individuals in the CFS group were on disability as compared to the MDD/CFS group, $\chi^2(1, N = 41) = 4.11$, $p < .05$.

Illness Classification by Standardized Clinically Empirical Criteria

Medical Outcomes Survey Short-Form-36. According to the CDC empirical case definition, participants are required to demonstrate functional impairment within one of the four areas: Physical Function, Role Physical, Role Emotional, and Social Function. One-way ANOVA

Table 1
Sociodemographic Characteristics Between the CFS, MDD/CFS, and MDD Groups

	CFS				MDD/CFS				MDD				
Characteristic	*n*	%	*M*	*(SD)*	*n*	%	*M*	*(SD)*	*n*	%	*M*	*(SD)*	Significance
Age	27		49	(13.2)	14		37	(12.3)	23		44	(15.5)	
Gender													
Male	2	7			1	7			3	13			
Female	25	93			13	93			20	87			
Race													
White	19	70			11	79			17	74			
Black	5	19			2	14			0	0			
Other	3	11			1	7			6	26			
Marital status													
Married	7	26			3	21			4	17			
Never married	11	41			8	57			15	65			
Separated/widowed/divorced	9	33			3	21			4	17			
Children													
Yes	17	63			5	36			8	35			
No	10	37			9	64			15	65			
Education													
High school degree or less	2	7			2	14			4	17			
Partial training	9	33			8	57			6	26			
College degree	8	30			3	21			7	30			
Grad/profession	8	30			1	7			6	26			
Work status													
On disability	13	48			3	21			3	13			*
Unemployed	4	15			2	14			7	31			
Work part-time	5	18			2	14			1	4			
Work full-time	5	18			7	50			12	52			

Note: CFS = chronic fatigue syndrome; MDD = major depressive disorder.
*Difference is statistically significant at the $p \leq .05$ level.

was used to assess the effect of physical impairment within four subscales of the *Medical Outcomes Survey Short-Form-36* for the three groups (CFS, MDD, and MDD/CFS). As seen in Table 2, there were significant effects for three of the subscales, but not social functioning. Using Tukey's honestly significant difference (HSD) post hoc test, significant differences were found for Role Physical; participants with CFS had significantly lower scores compared to both the MDD group ($p < .001$) and the MDD/CFS group ($p < .001$). In regard to physical functioning, the participants with CFS had significantly worse Physical Function impairment scores in comparison to participants with MDD ($p > .001$) and participants with MDD/CFS ($p < .001$). Finally, for role emotional functioning, the MDD/CFS group scored significantly lower on the Role Emotional scale than both the CFS ($p < .001$) and the MDD groups ($p < .001$).

Examining Table 3, it is apparent that all three illness groups met criteria for at least one of the four subscales and thus would meet the disability criteria for the empirical case definition of CFS. It is clear that significantly more participants from the MDD and MDD/CFS groups met Role Emotional criteria than the CFS group. However, if Role Physical or Physical Functioning criteria were used as the sole criterion for disability, significantly more participants within the CFS group would meet the disability criteria than those in the MDD/CFS and MDD groups.

Symptom Inventory analysis. There was a significant effect of the total CFS symptom scores, $F(2, 61) = 34.184$, $p < .001$. The MDD group had the lowest mean score, indicating that this group did not likely meet criteria for CFS. The CFS group mean score was directionally but not significantly higher than the MDD/CFS group score. Tukey post hoc tests indicated that the CFS and MDD/CFS groups scored significantly higher than the MDD group ($p < .001$). Examining Table 3, both the CFS and MDD/CFS groups had higher percentages of participants meeting CFS symptom criteria than those in the MDD group. The fact that 100% of participants in the CFS and MDD/CFS groups met criteria for this index suggests that many individuals without CFS will meet these cutoff criteria for symptom frequency and severity.

Table 2
Mean Differences Between the CFS, MDD/CFS, and MDD Groups on Criteria Variables

	CFS		MDD/CFS		MDD		
Variable	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	Significance
Medical Outcomes Survey Short-Form-36							
Role Physical	5.56	(16.01)[a,b]	51.79	(40.98)[b]	58.7	(45.61)[a]	***
Social Function	30.09	(28.43)	41.96	(23.31)	40.22	(25.27)	
Physical Function	37.41	(23.43)[a,b]	70.36	(32.90)[b]	76.74	(21.25)[a]	***
Role Emotional	69.14	(40.22)[a,b]	19.05	(31.25)[a]	30.43	(40.09)[b]	***
CDC Symptom Inventory							
CDC scores	43.97	(14.28)[b]	37.56	(10.54)[a]	17.05	(8.62)[a,b]	***
Multidimensional Fatigue Inventory							
General Fatigue	16.74	(2.90)[b]	16.86	(2.80)[a]	14.3	(3.42)[a,b]	**
Reduced Activity	14.44	(3.79)	13.64	(3.95)	13.17	(4.77)	

Note: Similar letter subscripts across rows indicate significant differences in means. CFS = chronic fatigue syndrome; MDD = major depressive disorder.
**Difference is statistically significant at the $p \leq .01$ level. ***Difference is statistically significant at the $p \leq .001$ level.

Table 3
Percentages of the CFS, MDD/CFS, and MDD Groups Meeting Specific CFS Criteria

Criteria	%CFS	%MDD/CFS	%MDD	Significance
Medical Outcomes Survey Short-Form-36				
Role Physical ≤ 50.0	96[a,b]	50[a]	44[b]	***
Social Function ≤ 75.0	96	100	91	
Physical Function ≤ 70.0	93[a,b]	43[a]	35[b]	***
Role Emotional ≤ 66.7	44[a,b]	93[a]	78[b]	***
Meets at least 1	100	100	100	
CDC Symptom Inventory				
CDC scores ≥ 25.0	100[a]	100[b]	9[a,b]	***
Multidimensional Fatigue Inventory				
General Fatigue ≥ 13.0	93	93	74	
Reduced Activity ≥ 10.0	85	86	78	
Meets at least 1	100	100	87	

Note: Similar letter subscripts across rows indicate significant differences in means. CFS = chronic fatigue syndrome; MDD = major depressive disorder.
***Difference is statistically significant at the $p \leq .001$ level.

The Multidimensional Fatigue Inventory. The CDC empirical case definition used the *Multidimensional Fatigue Inventory* to measure fatigue. There was a significant effect for General Fatigue, $F(2, 61) = 4.89$, $p < .05$, but no significant effect was found for Reduced Activity. Post hoc analysis using the Tukey HSD test revealed significant differences for General Fatigue. The MDD group scored significantly lower on the General Fatigue scale than both the CFS ($p < .01$) and MDD/CFS groups ($p < .01$). Inspecting Table 3, all participants within the CFS and MDD/CFS groups met one of the fatigue criteria. In addition, 87% of those in the MDD group also met one of the fatigue criteria. This again suggests that for the domain of fatigue, the empirical case criteria will select many individuals without CFS who will meet fatigue criteria for the empirical case definition.

Discussion

Reeves et al. (2005) claim that the empirical definition identifies people with CFS in a more precise manner than can occur in the more traditional way of diagnosis. Analyses from this study reveal that the new empirical case definition identified 38% of the MDD group as meeting CFS criteria. Cantwell (1996) argues that diagnostic criteria should specify which diagnostic instrument to use, what type of informants to interview, and how to determine the presence and severity of the criteria. The effort by Reeves et al. to specify a certain number and type of symptoms that should be present in order to make a particular diagnosis appears to be overinclusive, particularly for those having a primarily depressive disorder.

An analysis of the *Medical Outcomes Survey Short-Form-36* illustrates the problems with the cutoff criteria. When using the Reeves et al. (2005) cutoff points to classify functional impairment, all three groups (100%) met criteria for this instrument in Table 3. However, had Reeves et al. selected either Physical Function or Role Physical, better differentiation would have occurred, as there is a significant difference between the CFS group and the other two groups for these domains. Because individuals need only to score lower than the 25th percentile in one of these four areas in order to meet the CFS criteria, individuals might not have any reductions in key areas of physical functioning and only impairment in role emotional areas (e.g., problems with work or other daily activities as a result of emotional problems).

For Role Emotional, 93% of the MDD/CFS group and 78% of the MDD group met criteria, a percentage much higher than the CFS group (44%). Ware et al. (2000) found that the mean for Role Emotional for a clinical depression group was 38.9, indicating that almost all those with clinical depression would meet criteria for being within the lower 25th percentile on this scale (which was a score of less than or equal to 66.7). In addition, King and Jason (2005) compared a group diagnosed with CFS and a group diagnosed with MDD, and the latter group had lower scores than the group with CFS (37.8 vs. 48.9), but both groups would have met the CDC criteria as they both scored below 66.7. In contrast, if the criterion was a score lower than the 25th percentile on just Physical Function (less than or equal to 70), the participants with CFS would have met this criterion as their average score was 44, whereas many within the MDD group would have not met this criterion as their average score was 70.3.

Regarding the *Symptom Inventory*, 100% of both the CFS and MDD/CFS groups met criteria, indicating this instrument did not distinguish the individuals with CFS from individuals with major depression. It is probable that the *Symptom Inventory* misclassified the MDD/CFS group for several reasons. For example, the *Symptom Inventory* asks about the symptom occurrences within the past month rather than the past 6 months, as required by the Fukuda et al. (1994) case definition. The requirement for a participant to report a symptom for 1 month might include more individuals within the CFS category (e.g., a person who has experienced a physical illness such as influenza or a head cold could very well have experienced a severe sore throat for the past month). Even with summed scores for the empirical case definition needing to be greater than or equal to 25 (Reeves et al., 2005), the overall level of symptoms might be relatively low for patients with classic CFS symptoms (the criterion would be met if an individual rated only two symptoms as occurring all the time, and one was of moderate and the other of severe severity). Similarly, a person with MDD could endorse symptoms that would easily meet criteria for this scale, such as unrefreshing sleep, impaired memory, and headaches, and muscle pain at a moderate to severe level. However, the most important factor is that the *Symptom Inventory* does not distinguish critical symptoms for CFS such as postexertional malaise, unrefreshing sleep, and cognitive difficulties. Each symptom is given the same value, which means that a participant reporting severe and frequent headaches is given the same value as a participant reporting severe and frequent postexertional malaise. Overall, 14 individuals diagnosed with MDD scored 25 or higher on the *Symptom Inventory* and reported four or more symptoms. This demonstrates that individuals with primary psychiatric illnesses are not always excluded using the *CDC Symptom Inventory*.

The *Multidimensional Fatigue Inventory* was used to measure severe fatigue, yet 93% of both the CFS and MDD/CFS groups met criteria for General Fatigue, while 74% of the MDD group did as well. As for the criteria that Reeves et al. (2005) used, the primary developer of the *Multidimensional Fatigue Inventory* had this to say: "Regarding the criteria suggested by Reeves, we have no paper to back up their decision, but scanning their paper it appears that they used the median of their own data" (E. M. Smets, personal communication, June 29, 2006). In one study of three groups with CFS, the mean *Multidimensional Fatigue Inventory* General Fatigue scores were 18.3 to 18.8 (Tiersky, Matheis, DeLuca, Lange, & Nateson, 2003). When assessing Reduced Activity, 85% and 86% of both the CFS and MDD/CFS groups (respectively) met criteria, as did 78% of the MDD group. Therefore, 100% of the CFS and 100% of the MDD/CFS group met the CDC fatigue criteria. The problem with this instrument is that it is relatively easy to meet criteria for one of the two categories. In other words, a depressed person could easily respond positively to questions such as "I get little done" or "I do very little in a day" and answer negatively to "I feel very active" or "I think I do a lot in a day." Consequently, a depressed person would meet CFS criteria by answering "entirely true" to these types of items.

Inspecting the scores of a person with MDD who was inappropriately classified as having CFS highlights the problems with the CDC empirical criteria. A 26-year-old female with MDD met criteria for CFS using the CDC empirical case criteria (Reeves et al., 2005). For the *Medical Outcomes Survey Short-Form-36*, she met cutoff points for Social Function (scoring 37.5 when needing to score ≤ 75) and Role Emotional (scoring 0 when needing to score ≤ 66.7). With a clinical diagnosis of MDD, she demonstrated impairment with social and emotional functioning, two important traits of depression. This person scored 100 on Physical Function, which is the highest possible score on this measure, indicating that she had no difficulties with physical functioning, which would be a clear indicator that she did not have CFS. On the *CDC Symptom Inventory*, she reported that postexertional malaise was mild only some of the time, indicating that she did not have this cardinal symptom of CFS. For this individual and others within the MDD/CFS group, the instruments used to identify cases of CFS did not adequately exclude persons with primary psychiatric disorders.

Study Limitations

There were biases in using a convenience sample, and recruitment from a population-based referral source would have been preferable, but such samples are expensive to recruit. Also, the sample sizes overall were relatively small, but even though power was low to detect differences, we were able to find a number of significant outcomes, as represented in Tables 2 and 3. In addition, we focused on only one psychiatric disorder, and future studies might include anxiety disorders, which might also be misclassified. In addition, there is probably a redundancy in some of our findings, as some of the scales are correlated.

There are other ways that might be used to develop improvements in the CFS case definition. As an example, Jason, Corradi, and Torres-Harding (2007) factor analyzed the core symptoms as defined by the Fukuda et al. (1994) criteria, but this did not result in interpretable factors. However, when they included a larger group of theoretically defined symptoms in the factor analyses, an interpretable set of factors did emerge. The following factors were found: neurocognitive (e.g., slowness of thought), vascular (e.g., dizzy after standing), inflammation (e.g., chemical sensitivities), muscle/joint (e.g., pain in multiple joints), infectious (e.g., sore throat), and sleep/postexertional (e.g., unrefreshing sleep). These findings suggest that theoretical and empirical approaches to determining critical symptoms of CFS have considerable merit. The field of CFS studies needs to be grounded in empirical methods for determining a case definition versus more consensus-based efforts.

In conclusion, this study suggests that the Reeves et al. (2005) empirical case definition has broadened the criteria such that some individuals with a purely psychiatric illness will be inappropriately diagnosed as having CFS. The Reeves et al. empirical case definition used specific instruments (such as the *Medical Outcomes Survey Short-Form-36*) to make diagnostic decisions but included dimensions within them such as role emotional functioning that were not specific for this illness. Green, Romei, and Natelson (1999) found that 95% of individuals seeking medical treatment for CFS reported feelings of estrangement, and 70% believed that others uniformly attributed their CFS symptoms to psychological causes. Inappropriate inclusion of pure psychiatric disorders into the CFS samples may further contribute to the diagnostic skepticism and stigma that individuals with this illness encounter. Several researchers continue to believe that CFS should be considered a functional somatic syndrome (Barsky & Borus, 1999), characterized by diffuse, poorly defined symptoms that cause significant subjective distress and disability and that cannot be corroborated by consistent documentation of organic pathology. Taylor, Jason, and Schoeny (2001) have challenged this position, but ultimately assessment and criteria that fail to capture the unique characteristics of these illnesses might inaccurately conclude that only distress and unwellness characterize CFS, thus inappropriately supporting a unitary hypothetical construct called "functional somatic syndrome." Such blurring of diagnostic categories will make it even more difficult to identify biological markers for this illness, and if they are not identified, many scientists will be persuaded that this illness is psychogenic (Jason & Richman, 2008). Ultimately, using a broad or narrow definition of CFS will have important influences on CFS epidemiologic findings, on rates of psychiatric comorbidity, on how patients are treated, and ultimately on the likelihood of finding biological markers for this illness.

Note

1. The scale we used had five choices, and we needed to convert the ratings to a 4-point scale. We divided the five items by 4, which came to .8. We then made each increment in value .8.

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