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GENERALIZED ANXIETY DISORDER WITHIN THE COURSE OF MAJOR DEPRESSIVE DISORDER: EXAMINING THE UTILITY OF THE DSM-IV HIERARCHY RULE

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Abstract

Background—The current Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) specifies that generalized anxiety disorder (GAD) should not be diagnosed if it occurs exclusively during an episode of a major depressive disorder (MDD) or another mood disorder. This hierarchy rule was intended to promote diagnostic parsimony, but may result in the loss of important clinical information. The goal of this study was to compare individuals with MDD, comorbid MDD and GAD, and GAD within the course of MDD at intake and 12-month follow-up on self-report measures, clinician ratings, and rates of comorbidity.

Methods—Participants were divided into three diagnostic groups: MDD without GAD (n = 124), comorbid MDD and GAD (n = 59), and GAD within the course of MDD (n = 166). All the participants completed a semi-structured clinical interview and self-report measures assessing psychopathology, temperament, and functional impairment. A subset of the total sample completed a follow-up assessment of 12 months postintake.

Results—Individuals with comorbid MDD and GAD and GAD within the course of MDD reported more psychopathology, negative affect, and functional impairment at intake than individuals with MDD only. The presence of GAD at intake, however, did not differentially predict symptom severity, functional impairment, or the presence of comorbidity at 12-month follow-up.

Conclusions—Cross-sectional findings indicate that individuals with GAD within the course of MDD experience levels of psychopathology, functional impairment, and comorbidity similar to those found in individuals with comorbid GAD and MDD. Preliminary longitudinal findings, however, suggest that the presence of GAD in patients with MDD does not have prognostic significance.

Keywords

anxiety; classification; comorbidity; depression; diagnosis

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INTRODUCTION

Researchers and clinicians have long recognized the overlap between major depressive disorder (MDD) and generalized anxiety disorder (GAD). The two disorders share several diagnostic features[1] and their frequent co-occurrence likely reflects a shared genetic diathesis.[2,3] Given the similarities between MDD and GAD, the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR) specifies that GAD should not be diagnosed if it occurs exclusively during MDD or another mood disorder.[1]

The current diagnostic hierarchy rule reflects a longstanding debate about GAD's status as an independent diagnosis. In DSM-III, GAD was a residual category, meaning that a clinician could only assign the diagnosis if a patient failed to meet criteria for any other anxiety disorder.[4] In DSM-III-R, the diagnostic criteria were revised substantially and GAD became an independent category, although the hierarchy rule was instituted to foster diagnostic parsimony.[5] The DSM-IV definition of GAD, which has been maintained in DSM-IV-TR, requires that a patient's worries could be excessive, difficult to control, and accompanied by three of six associated symptoms.[1] Revisions to the definition of GAD have resulted in improved diagnostic reliability,[6] and helped to clarify the relationship between GAD and other emotional disorders. Several studies have demonstrated that DSM-IV GAD, even in the absence of comorbid disorders, is associated with significant functional impairment.[7,8] Thus, although the current hierarchy rule helps to prevent overdiagnosis, it may also obscure true rates of comorbidity between MDD and GAD and result in the loss of important clinical information relevant to the description and treatment of individual patients.[2,9]

OVERLAP BETWEEN GAD AND MDD

Clinical and epidemiological studies have found high rates of comorbidity between MDD and GAD.[2,7,10–12] However, it is important to note that adherence to the DSM-IV hierarchy rule may have led researchers to vastly underestimate rates of comorbidity between these two disorders. For example, findings from Brown et al.[2] demonstrated that GAD co-occurred in only 5% of cases with a current principal diagnosis of MDD when interviewers adhered to the hierarchy rule. When the hierarchy rule was ignored, GAD occurred in 67% of cases of principal MDD, suggesting that adherence to the rule masks the genuine rates of co-occurrence between the clinical features MDD and GAD.

High rates of comorbidity between MDD and GAD are consistent with findings from the studies of the structural relationships between anxiety and mood disorders[13] and behavioral genetics.[3,14] In a structural equation modeling study using a large clinical sample, the zero-order correlation between the MDD and GAD factors ($r = .63$) was the highest among any mood and anxiety disorders and both the MDD and GAD factors demonstrated significant, positive relationships with the higher-order trait of negative affect.[13] Despite the strong relationship between MDD and GAD, a model collapsing MDD and GAD into one factor did not fit the data as well as a model in which these were maintained as separate factors, a finding that offers some support for the discriminant validity of GAD and MDD as separate constructs. The overlap between MDD and GAD, and among anxiety and mood disorders in

general, has led researchers to speculate that certain dimensions of temperament (e.g., neuroticism or negative affect) act as vulnerability factors for multiple disorders.[15,16]

Indeed, findings from twin studies have suggested that GAD and MDD share a genetic vulnerability.[14,17] The disorders, however, have distinct environmental risk factors.[3] As in the studies of diagnostic comorbidity, adherence to the hierarchy rule can dramatically alter findings. For example, Kendler[3] found that when GAD was diagnosed in accordance with the hierarchy rule, the correlation between environmental risk factors was zero. When the hierarchy rule was ignored, however, the correlation rose to .70.

CLINICAL UTILITY OF THE DSM-IV HIERARCHY RULE

Adherence to the hierarchy rule may also have important clinical implications. Several epidemiological studies have indicated that the patients with comorbid anxiety and depression experience poorer functioning and slower treatment response than those with "pure" depression.[8,18,19] In fact, research suggests that depressed individuals with comorbid anxiety symptoms report more severe depression, increased suicidality, and greater Axis II symptoms than the individuals diagnosed with MDD alone.[20,21] Individuals with comorbid MDD and GAD are more likely to receive mental health services, take psychiatric medication, and experience recurrent lifetime episodes of depression than the individuals with MDD alone.[22] Furthermore, the studies investigating the efficacy of antidepressant medication have demonstrated lower rates of remission and increased frequency and intensity of side effects among individuals with anxious depression than those with depression alone.[23] These findings suggest that the identification of comorbid anxiety in patients with depression has important implications for treatment planning and prognosis.

Only one earlier study has compared the depressed patients who would meet the criteria for GAD were it not for the hierarchy rule ("modified GAD") to patients with comorbid GAD and MDD and depressed patients without symptoms of GAD. Zimmerman and Chelminski[9] compared these three groups of outpatients on measures of psychopathology, functional impairment, and comorbidity. In this study, patients with comorbid MDD and GAD and modified GAD reported significantly more suicidal ideation and impairment in social functioning than did patients with depression alone. Furthermore, the modified GAD group was not significantly different from the comorbid group on most measures of depression, suicidal ideation, social functioning, and comorbidity. These cross-sectional findings suggest that it may be clinically informative to diagnose GAD when it occurs within the course of MDD, though longitudinal data are necessary to determine if the course of modified GAD is more similar to comorbid MDD and GAD than to depression alone. Given that comorbid MDD and GAD is associated with a more chronic course, greater treatment-seeking, and poorer response to treatment than MDD alone,[8,18,20,22] recognition of GAD symptoms in patients with MDD may have significant prognostic implications.

The purpose of this study was to replicate and extend the findings of Zimmerman and Chelminski[9] by comparing patients with MDD, comorbid MDD and GAD, and GAD within the course of MDD at intake and at 12-month follow-up. No earlier study has examined the utility of the hierarchy rule using both cross-sectional and longitudinal data. It was predicted that the comorbid and "modified" groups would exhibit greater comorbidity

and functional impairment, and higher scores on measures of psychopathology and neuroticism, than the MDD group at intake and that these differences would persist at 12-month follow-up.

METHOD

PARTICIPANTS

Intake sample—The sample consisted of 349 outpatients who presented for intake assessments at the Center for Anxiety and Related Disorders, a mood and anxiety disorders clinic. The majority of the sample was female (57.9%), and the average age of participants was 34.13 years (*SD* = 12.50, range = 18–71). The majority (84.2%) of participants identified as Caucasian. Four percent of participants identified as African American, 4.6%as Hispanic, and 7.2% as Asian/Pacific Islander. The primary inclusion criterion for the study was a current principal (n = 249) or co-principal diagnosis (n = 100) of MDD. The most commonly occurring co-principal diagnoses were social phobia (n = 28), panic disorder with agoraphobia (n = 25), and GAD (n = 23). Individuals were excluded from the study if they reported suicidal intent and/or plan, psychotic symptoms, two or more psychiatric hospitalizations for serious mental illness within the past five years, or significant cognitive impairment (e.g., diagnosis of dementia, mental retardation). On a self-report measure of depression (Beck Depression Inventory (BDI), described in the Method section), 42.9% of participants denied having any thoughts of suicide, 53.0% reported having thoughts of suicide but denied intent, and 5.1% endorsed the item “I would like to kill myself.” There were no significant differences between groups in self-reported suicidality. At the time of the intake assessment, patients were required to meet psychotropic medication and psychotherapy stabilization criteria (i.e., maintenance of the same dose of an antidepressant for at least three months or an anxiolytic for at least one month, or discontinuation of a psychotropic medication at least one month before the assessment).

There were high rates of comorbidity in the study sample. Within the intake sample, the most common comorbid diagnoses, aside from GAD, were social phobia (51.3%), panic disorder with or without agoraphobia (23.5%), specific phobia (12.3%), obsessive–compulsive disorder (11.5%), dysthymic disorder (10.3%), post-traumatic stress disorder (5.2%), anxiety disorder not otherwise specified (2.9%), and agoraphobia without panic disorder (0.9%).

The intake sample was divided into three diagnostic groups: (1) the MDD (GAD) group, composed of individuals who met criteria for both MDD and GAD, but were not assigned a diagnosis of GAD due to the DSM-IV hierarchy rule (n = 166), (2) the MDD+GAD group, comprosed of individuals who were diagnosed with comorbid MDD and GAD while adhering to the DSM-IV hierarchy rule (n = 59), and (3) the MDD group, consisting of individuals who were diagnosed with MDD, but did not meet criteria for an additional diagnosis of GAD regardless of whether assessors adhered to the hierarchy rule (n = 124). One-way analysis of variance (ANOVA), Student–Newman–Keuls post hoc tests, and χ^2 tests were used to examine differences between the three diagnostic groups in age, gender, and race. No significant differences were found.

Twelve-month follow-up sub-sample—The follow-up sample consisted of 59 outpatients from the original sample who participated in a 12-month follow-up study. Fifty-eight of these patients completed the questionnaires and received a diagnostic interview at follow-up. One patient only completed the questionnaires. The number of participants in each of the three initial diagnostic groups was as follows: MDD (GAD) group (n = 25), MDD+GAD group (n = 10), and MDD group (n = 23). Of the 58 outpatients who completed follow-up interviews, 29 (50%) reported that they had received cognitive-behavioral treatment at the center subsequent to their initial assessment. Sixty percent (n = 6) of individuals in the MDD+GAD group, 53.8% (n = 14) in the MDD (GAD) group, and 40.9% (n = 9) in the MDD group reported receiving treatment at the center. There was no significant difference between groups in the proportion of patients receiving treatment at the center. Independent samples t-tests were conducted to compare study completers and noncompleters on several demographic and clinical variables measured at the intake assessment, including age, sex, and self-reported depression, worry, and functional impairment. On one self-report measure of depression (the depression subscale of the Depression Anxiety Stress Scales, described below), noncompleters reported higher levels of depression (M = 13.11, SD = 11.56) than completers (M = 11.56, SD = 4.98), t (327) = 2.10, P = .04. The magnitude of the difference was small (η^2 = .01). There were no significant between-group differences on another self-report measure of depression (BDI, described below) or on any other variables examined. These findings suggest that the follow-up sub-sample is representative of the intake sample.

STUDY DESIGN AND PROCEDURE

Written consent was obtained from all the participants before the participation in the study. During the first study visit (Time 1), participants completed an initial packet of self-report questionnaires and underwent a semi-structured diagnostic interview. Patients who completed the intake assessment were contacted 12 months after their initial study participation and invited to complete a follow-up assessment (Time 2).

DIAGNOSTIC ASSESSMENT

Anxiety Disorders Interview Schedule for DSM-IV-Lifetime Version (ADIS-IV-L)[24] and Non-Lifetime Version (ADIS-IV)[25]—The ADIS-IV-L was administered at intake and the ADIS-IV was administered at the 12-month follow-up assessments. Both instruments are semi-structured interviews that assess the DSM-IV anxiety, mood, somatoform, and substance use disorders and screen for the presence of additional disorders (e.g., psychosis). The ADIS-IV is identical to the ADIS-IV-L except that it (a) includes several questions that assess the nature of treatment received since the intake and (b) does not include sections about past diagnoses. For each diagnosis assigned, assessors assigned a 0–8 clinical severity rating (CSR) to indicate their judgment of the distress and impairment associated with the disorder. In participants receiving multiple diagnoses, the “principal” diagnosis was the one with the highest CSR. All other diagnoses were referred to as “additional” diagnoses. When assessors judged two disorders to be equally interfering and/or distressing, “co-principal” diagnoses were assigned. Assessors adhered to all DSM-IV hierarchy rules when assigning diagnoses, but noted whether participants would have met criteria for GAD were it not for these rules. Earlier research has established that the ADIS-

IV-L and ADIS-IV possess good-to-excellent reliability for the majority of anxiety and mood disorders.[6] In addition to assigning DSM-IV-TR diagnoses, interviewers rated participants on the Global Assessment of Functioning (GAF) scale (DSM-IV Axis V).

SELF-REPORT MEASURES

Depression Anxiety Stress Scales (DASS-21)[12]—The 21-item version of the DASS was used in this study. The scale consists of three subscales designed to measure current (past week) symptoms of depression, anxiety, and stress. Each item is rated on a 4-point Likert scale, ranging from 0 (“did not apply to me at all”) to 3 (“applied to me very much or most of the time”). The DASS has shown strong psychometric properties in both clinical and nonclinical samples.[26,27]

BDI[28]—The BDI is a widely used self-report measure of depression. Each of the BDI’s 21 items is rated on a 4-point scale, ranging from 0 to 3. The BDI has demonstrated good internal consistency, validity, and test–retest reliability.[29]

Penn State Worry Questionnaire (PSWQ)[30]—The PSWQ is a 16-item self-report instrument that assesses excessive and uncontrollable worry. Items are rated on a 5-point Likert scale, ranging from 1 (“not at all typical of me”) to 5 (“very typical of me”). Items are summed to produce a total scale score, with higher scores reflecting greater degrees of worry. The PSWQ has demonstrated sound psychometric properties in both clinical and nonclinical samples.[31,32]

Behavioral Inhibition/Activation Scales (BIS/BAS)[33]—The BIS/BAS is a 20-item self-report instrument designed to assess Gray’s[34] personality constructs of behavioral inhibition and activation. Items are rated on a 4-point Likert scale, ranging from 1 (“quite untrue of you”) to 4 (“quite true of you”). The BIS/BAS is composed of four subscales: the BIS scale, the Reward Responsiveness scale, the Drive scale, and the Fun Seeking scale. The Reward Responsiveness, Drive, and Fun Seeking subscales are summed to produce the overall BAS scale. The BIS/BAS has demonstrated excellent psychometric properties in clinical samples (i.e., individuals with mood and anxiety disorders).[35]

Positive and Negative Affect Scales (PANAS)[36]—The PANAS is a 20-item self-report measure with 10 items measuring positive affect and 10 items measuring negative affect. Items are rated on a 5-point Likert scale, ranging from 1 (“very slightly or not at all”) to 5 (“extremely”). Psychometric evaluation of the PANAS supports the reliability and validity of this scale.[36] The trait version of the PANAS was administered in this study.

NEO Five Factor Inventory (NFFI)[37]—The NFFI is a 60-item self-report inventory, which assesses the five personality dimensions derived from the five-factor model of personality (neuroticism, extraversion, openness, agreeableness, and conscientiousness). Items are rated on 5-point Likert scale, which ranges from 0 (“strongly disagree”) to 4 (“strongly agree”). The NFFI is a widely used self-report personality measure that has demonstrated excellent reliability and validity.[37]

Subjective Symptoms Scale (SSS)[38]—The SSS is a 5-item questionnaire that evaluates interference with work, home management, private leisure, social leisure, and family relationships as a result of current symptoms. Earlier studies have supported the unidimensionality and psychometric validity of the SSS.[39]

RESULTS

CROSS-SECTIONAL ANALYSES

One-way ANOVAs and Student–Newman–Keuls post hoc tests were conducted to compare diagnostic groups on all self-report measures of psychopathology, personality, and functional impairment (i.e., DASS-21, BDI, PSWQ, BIS/BAS, PANAS, NFFI, SSS; see Table 1). In addition, a one-way ANOVA was performed using clinician-assigned GAF ratings. Significant between-group differences were observed on several measures, with the MDD group reporting less negative affect, behavioral inhibition, and worry than the MDD+GAD and MDD (GAD) groups. Clinicians rated individuals in the MDD+GAD and MDD (GAD) groups as more functionally impaired than individuals in the MDD group. No differences on self-report measures or clinician-rating measures were observed between the MDD+GAD and MDD (GAD) groups.

A χ^2 test was run to determine if the frequency of comorbid diagnoses differed between diagnostic groups (Table 2). For the purposes of this analysis, all DSM-IV Axis I and Axis II diagnoses (with the exception of MDD and GAD) were included in the frequency counts. The number of comorbid diagnoses was dichotomized, such that cases were classified as either having (1) zero or one comorbid diagnoses or (2) two or more comorbid diagnoses. The Pearson χ^2 value was significant, $\chi^2(1, N = 349) = 7.55$, $P<.05$, with individuals in the MDD group more likely to have zero or one comorbid diagnoses (67.7%) than individuals in the MDD (GAD) (51.8%) or MDD+GAD (55.9%) groups.

LONGITUDINAL ANALYSES

A series of 2 (Time) × 3 (Diagnostic Group) mixed-model ANOVAs were used to examine change in self-reported symptom severity, personality, and functional impairment between the two study time points. In these analyses, the between-subjects factor was Diagnostic Group at Time 1 [MDD versus MDD (GAD) versus MDD+GAD], and the within-subjects factor was Time (intake versus 12-month follow-up). Separate mixed-model ANOVAs were conducted using each of the following outcome measures: DASS-21, BDI, PSWQ, BIS/BAS, PANAS, NFFI, and SSS scores. Means and standard deviations are presented in Table 3.

Tests of within-subject effects demonstrated a significant effect of Time on the BDI, $F(1,58) = 25.34$, $P<.001$, $\eta^2 = .32$, with self-reported depression decreasing in all three groups between Time 1 and Time 2. A similar pattern were observed on the PSWQ, $F(1,58) = 7.62$, $\eta^2 = .12$, PANAS—Negative Affect, $F(1,58) = 10.41$, $P<.005$, $\eta^2 = .16$, BIS, $F(1,58) = 6.93$, $P<.05$, $\eta^2 = .11$, and SSS, $F(1,58) = 38.14$, $P<.001$, $\eta^2 = .41$, with scores declining between Time 1 and Time 2 in all groups. The Group × Time interaction effect on the SSS approached significance, $F(2,58) = 2.84$, $P = .07$, $\eta^2 = .09$, with the MDD+GAD group

reporting a larger decrease in functional impairment than the other two groups. No significant main effects or interaction effects were found for analyses examining change in DASS-21 and PANAS—Positive Affect scores.

A significant Time × Group interaction effect was observed on the BAS, $F(2,58) = 6.06$, $P < .005$, $\eta^2 = .16$. Examination of the cell means indicated that BAS scores in the MDD+GAD group declined between intake and follow-up, scores in the MDD (GAD) group increased, and scores in the MDD group remained stable.

Logistic regression was used to examine the influence of diagnostic group and comorbidity at intake on diagnostic comorbidity at 12-month follow-up. Owing to sample size constraints, only the MDD (GAD) and MDD groups were included in this analysis. Diagnostic group and the number of comorbid diagnoses at intake were included as predictors in the regression equation. The dichotomous dependent variable was the presence or absence of one or more comorbid diagnoses at 12-month follow-up. The overall regression equation was significant, $\chi^2(2) = 8.9$, $P < .05$. The number of comorbid diagnoses at intake predicted the presence of follow-up comorbidity (odds ratio = 2.61, $CI_{95} = 1.13, 5.98$), but diagnostic group did not add any predictive value to the equation.

DISCUSSION

Earlier studies have questioned the validity of the DSM-IV hierarchy rule that prohibits the diagnosis of GAD when its symptoms occur within the course of a major depressive episode.[8,9] Citing evidence that individuals who endorse symptoms of both MDD and GAD report higher levels of comorbidity, more severe depression, and poorer social functioning than depressed individuals without GAD symptoms, Zimmerman and Chelminski[9] concluded that the hierarchy rule should be eliminated from future editions of the DSM. The goal of this study was to replicate and extend the earlier findings by comparing outpatients with MDD, comorbid MDD and GAD, and GAD within the course of MDD at intake and 12-month follow-up on rates of comorbidity and measures of psychopathology, personality, and functional impairment.

Results of this study indicate that the individuals with symptoms of GAD during the course of a major depressive episode, or MDD (GAD), report levels of negative affect, psychopathology, and functional impairment similar to those reported by individuals diagnosed with comorbid MDD and GAD. Furthermore, patients with MDD+GAD and MDD (GAD) exhibit greater Axis I comorbidity and report more functional impairment, negative affect, and worry than do patients diagnosed with MDD without GAD (MDD only). These findings are generally consistent with those of Zimmerman and Chelminski[9] and suggest that observation of the hierarchy rule obscures an important clinical information by failing to adequately describe the nature and severity of patients' symptoms. Contrary to Zimmerman and Chelminski's[9] findings, there were no between-group differences in self-reported depression.

Based on the aforementioned cross-sectional findings and on earlier research suggesting that comorbid anxiety and depression are associated with a more severe course and poorer

treatment outcomes than depression alone,[10,23,40] it was hypothesized that the MDD+GAD and MDD (GAD) groups would exhibit greater psychopathology, comorbidity, and negative affect at follow-up than the MDD only group. This study suggests, however, that the presence of GAD symptoms at intake was not associated with differential temporal course. In the present sample, patients in all the three diagnostic groups reported a decrease in depression, negative affect, behavioral inhibition, and functional impairment between assessment points, with no significant differences among groups. Comorbidity at intake (i.e., the number of comorbid diagnoses other than GAD or MDD), but not diagnostic group, significantly predicted the number of comorbid diagnoses assigned at 12-month follow-up assessments. The only significant Time × Group interaction effect was observed on a measure of behavioral activation. The MDD+GAD group was the only group to exhibit a decline in behavioral activation between intake and follow-up, despite the fact that all the three groups reported similar decreases in worry, depression, and behavioral inhibition. Overall, these preliminary longitudinal findings suggest that individuals diagnosed with MDD+GAD and MDD (GAD) do not experience poorer outcomes at 12-month follow-up than the individuals with MDD. The significant finding on the BAS must be interpreted with caution given the small sample size and the potential for Type I error, but is interesting given evidence that the levels of behavioral activation predict the course of depression, with higher levels of drive and reward responsiveness associated with lower levels of depression.[41]

The absence of the group differences on most follow-up measures in this study is consistent with treatment studies finding similar outcomes in both “pure” depression and comorbid depression and anxiety.[42,43] Furthermore, several studies of other emotional disorders have indicated that disorder-specific treatment may lead to an overall reduction in comorbidity.[32,44–46] These studies suggest that initial levels of comorbidity do not predict short-term prognosis, although the long-term impact of comorbidity requires further study. In one of the few studies reporting long-term follow-up data, overall rates of comorbidity declined from pre to post-treatment for panic disorder, but returned to baseline levels two years later (despite a continued remission in panic symptoms).[32] This study provides preliminary evidence that the individuals who experience symptoms of comorbid GAD or GAD within the course of MDD do not evidence poorer outcomes at 12-month follow-up than the outpatients with MDD. However, due to the modest size of the follow-up sample, there may not have been sufficient power to detect between-group differences in outcome measures.

The diagnostic hierarchy rule was included in DSM-IV, in part, because GAD was regarded as an epiphenomenon of depression with inadequate discriminant validity.[47] Since then, research has supported GAD’s status as an independent diagnostic category and demonstrated that its symptoms are uniquely associated with significant functional impairment and distress.[8,13] The results of this study support the notion that individuals diagnosed with GAD in addition to MDD (ignoring the diagnostic hierarchy rule) experience more severe psychopathology and functional impairment at intake than individuals with MDD alone. Although the results of cross-sectional analyses raise doubts about the diagnostic hierarchy rule, longitudinal analyses suggest that the presence of GAD in patients with MDD does not have prognostic significance at 12-month follow-up and that adhering to the hierarchy rule may not obscure importance information about the course of MDD.

Future research is necessary to replicate these longitudinal findings and to clarify the course of MDD, MDD and comorbid GAD, and GAD within the course of MDD. Sample size limitations in this study prohibited the examination of interactions between diagnostic group and treatment status, but future studies might examine differential treatment response in these diagnostic groups. One might predict, for example, that individuals with MDD (GAD), whose GAD symptoms have not occurred for a significant period of time outside of depression, would experience a simultaneous remission of their MDD and GAD symptoms and better treatment outcomes than individuals with comorbid MDD and GAD. Although multiple studies have examined treatment response in patients with symptoms of both anxiety and depression,[23,40] none have compared patients meeting the criteria for MDD, comorbid MDD and GAD, and GAD within the course of MDD. By examining the impact of GAD symptoms on treatment outcomes in patients with MDD, researchers could further clarify the prognostic implications of the DSM-IV hierarchy rule.

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TABLE 1

Results of ANOVAs examining differences on measures of psychopathology, personality, and functional impairment between the MDD (GAD), MDD +GAD, and MDD only groups at intake

	MDD (GAD) (a)		MDD+GAD (b)		MDD only (c)			
Measure	***M***	***SD***	***M***	***SD***	***M***	***SD***	***F***	**Pairwise comparison**
DASS-S	13.05	4.51	12.27	4.46	10.10	5.14	13.38**	a, b>c
DASS-D	12.78	4.99	13.70	5.66	12.52	4.97	1.04	
DASS-A	8.01	4.83	7.39	4.54	6.45	5.00	3.46*	n.s.
BDI	25.89	8.56	26.89	9.58	24.43	8.34	1.79	
PSWQ	68.24	9.75	69.11	7.92	59.87	13.15	24.22**	a, b>c
BIS	25.54	2.45	25.58	2.59	23.88	3.62	12.13**	a, b>c
BAS	36.72	6.95	39.02	6.51	36.68	6.91	2.61	
PANAS-N	34.82	7.18	34.18	5.66	30.74	8.59	10.52**	a, b>c
PANAS-P	25.33	7.62	24.76	6.57	25.27	7.51	0.12	
SSS	4.45	1.90	4.25	1.96	4.11	1.84	1.12	
GAF-P	62.51	11.39	62.20	10.51	66.81	9.88	6.71**	a, b>c
GAF-C	56.98	11.16	57.83	10.54	60.23	7.93	3.80*	n.s.

Student–Newman–Keuls post hoc tests were conducted to examine the nature of significant omnibus main effects. DASS-S, Depression Anxiety Stress Scales—Stress subscale; DASS-D, Depression Anxiety Stress Scales—Depression subscale; DASS-A, Depression Anxiety Stress Scales—Anxiety subscale; BDI, Beck Depression Inventory; PSWQ, Penn State Worry Questionnaire; BIS, Behavioral Inhibition Scale; BAS, Behavioral Activation Scale; PANAS-N, Negative Affect Scale; PANAS-P, Positive Affect Scale; SSS, Subjective Symptoms Scale; GAF-P, Highest Global Assessment of Functioning rating in past year; GAF-C, Current Global Assessment of Functioning rating; n.s., not significant.

*$P<.05$,

**$P<.001$.

TABLE 2

Percentages of individuals with comorbid Axis I diagnoses among MDD (GAD), MDD+GAD, and MDD only groups at intake

	Diagnostic group		
Number of comorbid diagnoses	**MDD (GAD) (%)**	**MDD+GAD (%)**	**MDD only (%)**
0 or 1	51.8	55.9	67.7
≥2	48.2	44.1	32.3

$\chi^2(1, N = 349) = 7.55, P < .05$.

TABLE 3

Means and standard deviations on self-report measures for cases with data at both intake and 12-month follow-up

	MDD (GAD)				MDD+GAD				MDD only			
	Intake		Follow-up		Intake		Follow-up		Intake		Follow-up	
Measure	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
DASS-S	12.60	4.33	19.08	10.06	12.20	3.74	10.70	6.91	9.09	4.59	11.59	9.39
DASS-D	10.44	4.87	13.76	8.40	14.50	4.93	10.50	8.03	11.50	4.80	14.14	12.94
DASS-A	8.32	5.04	9.64	8.56	6.30	3.68	5.80	6.30	6.14	5.05	7.68	8.85
BDI	23.62	8.84	17.27	11.09	29.60	7.26	18.50	7.37	23.86	9.34	16.09	14.30
PSWQ	67.81	9.33	61.00	12.22	68.80	7.02	64.90	13.94	60.18	13.42	54.86	14.17
BIS	25.50	2.34	24.71	2.93	25.60	2.59	24.90	3.14	24.70	3.24	23.35	3.87
BAS	36.44	7.17	39.08	7.08	40.00	5.01	35.60	5.80	36.39	6.70	36.52	8.42
PANAS-N	35.50	6.20	29.38	8.99	32.50	5.56	30.60	8.41	31.70	8.76	25.04	9.24
PANAS-P	27.32	7.23	30.16	8.75	24.20	6.07	24.90	6.61	24.87	7.69	27.26	7.79
SSS	4.22	1.70	3.32	2.08	4.34	1.65	1.77	1.87	3.87	1.77	2.35	2.63

DASS-S, Depression Anxiety Stress Scales–Stress subscale; DASS-D, Depression Anxiety Stress Scales—Depression subscale; DASS-A, Depression Anxiety Stress Scales—Anxiety subscale; BDI, Beck Depression Inventory; PSWQ, Penn State Worry Questionnaire; BIS, Behavioral Inhibition Scale; BAS, Behavioral Activation Scale; PANAS-N, Negative Affect Scale; PANAS-P, Positive Affect Scale; SSS, Subjective Symptoms Scale.