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Implications of the DSM's emphasis on sadness and anhedonia in major depressive disorder

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Abstract

At least five symptoms must occur for a DSM diagnosis of major depressive disorder (MDD), one of which must be sadness or anhedonia. The present study is the first known investigation of the implications of the presence or absence of these prioritized symptoms on symptom expression and clinical characteristics among 564 young adults with MDD. Differences in symptom expression and clinical characteristics occurred among MDD participants with sadness relative to those without sadness as well as among MDD participants with anhedonia relative to those without anhedonia. Differential symptom expression could have important implications for the etiology, prevention, and treatment of MDD.

Keywords

Depression; Sadness; Anhedonia; Adolescent

1. Introduction

Implications of the DSM's Emphasis on Sadness and Anhedonia in Major Depressive Disorder 1. Introduction According to the Diagnostic and Statistical Manual of Mental Disorders (*DSM-IV-TR*, American Psychiatric Association, 2000), at least five symptoms must occur for a diagnosis of major depressive disorder (MDD), one of which must be either sadness or anhedonia. Given that these two symptoms are prioritized by the DSM, the question arises as to what are the implications of presence or absence of these symptoms in individuals with MDD. In other words, do patients with anhedonia have a different pattern of symptoms than patients without anhedonia and do patients with sadness have a different pattern of symptoms than patients without sadness? Such differential symptom expression could have important implications for understanding the etiology, prevention, and treatment of MDD. For example, perhaps the emphasis on these two depressive symptoms at least partially explains the heterogeneity of symptom expression among individuals with MDD,

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such as why some individuals with MDD experience increased appetite while others experience decreased appetite. However, to our knowledge, this question has not been empirically examined.

There is some evidence to suggest that differential symptom patterns may exist. MDD individuals with anhedonia have been found to demonstrate greater social impairment, have higher scores on measures of depression and hopelessness, be less neurotic, be younger, and are more likely to be female when compared to MDD individuals without anhedonia (Fawcett et al., 1983). There is also evidence to suggest a correlation between anhedonia and psychomotor retardation among adults with MDD (e.g., Lemke et al., 1999). Depression with melancholia (a defining characteristic of which is loss of interest or pleasure in nearly all activities) has been found to be associated with loss of appetite (e.g., Kazes et al., 1993). Additionally, negative emotions such as sadness have been linked to increased eating in some individuals (e.g., Geliebter & Aversa, 2003).

The present study serves as the first known comprehensive attempt to examine the effects of the presence or absence of sadness and anhedonia on the remaining DSM symptoms of MDD among young adults. The present study also examined the effects of the presence or absence of sadness and anhedonia on both DSM criteria as well as clinical characteristics of MDD. Clinical characteristics were examined to investigate a wider range of the implications of the prioritization of sadness and anhedonia on the expression of MDD. It was hypothesized that different symptoms would be correlated with the presence of anhedonia than in the absence of anhedonia and that different symptoms would be correlated with the presence of sadness than in the absence of sadness. We specifically expected that the presence of anhedonia would be associated with indicators of impaired hedonics (e.g., decreased appetite, decreased desire to socialize). Gender differences were also analyzed to determine if males and females differ with regard to how the presence or absence of sadness and anhedonia influenced overall symptom expression.

2. Method

2.1 Participants and procedures

The sample was drawn from the Oregon Adolescent Depression Project. Participants were randomly selected from nine senior high schools representative of urban and rural districts in western Oregon. A total of 1,709 adolescents completed the initial (T1) assessments, with an overall participation rate of 61%. Specific comparisons were made to determine the representativeness of this sample (see also Lewinsohn et al., 1997; Lewinsohn et al., 2001). First, demographic characteristics of participants were compared to 1980 census data, revealing no differences in gender, ethnicity, or parental education between our sample and census data for the region. Second, demographic characteristics of participants were compared to those of adolescents who declined. Differences were minimal. Decliners were less likely to be from two-parent families (74% vs. 66%) and had a lower average socioeconomic status, although both groups represented the middle class. Decliners did not differ from participants on type or number of current and lifetime diagnoses, number or extent of clinical symptoms, race, current employment status of parents, and questionnaire variables. Overall, the analyses indicated that the participants in our sample may be considered to be representative of high school students in western Oregon. At T1, approximately one-half of the sample was female (53.7%), with an average age of 16.6 (SD = 1.2). A total of 8.9% were nonwhite, 71.3% were living with two parents (53% were living with two biological parents), and 12.3% had repeated a grade in school. Parental education level (maximum value for mother or father) was as follows: 46.9% had an academic or professional degree, 35.1% had a partial college education, 16.1% had completed high

school, and 1.9% had not completed high school. After a thorough description of the study, written informed consent was obtained.

Approximately one year after T1, 1,507 participants (88.1%) returned for a Time 2 (T2) readministration of the interview and questionnaire (mean T1-T2 interval = 13.8 months, *SD* =2.3). Few differences emerged between participants and nonparticipants at T1, and details are provided elsewhere (Lewinsohn et al., 1993). There was no relation between MDD status and attrition.

At age 24 (mean = 24.6 years, *SD* = 0.61), all participants with a history of MDD at T2 (*n* = 360) or a history of non-mood disorders (*n* = 284), and an approximately equal number of young adults with no history of psychopathology by T2 (*n* = 457) were invited to participate in a T3 evaluation. Of the 1,101 T2 participants invited for a Time 3 (T3) interview, 941 (85%) completed the evaluation. The 941 T3 participants included 539 (57%) women. Most participants were Caucasian (89%), with 3% Hispanic, 3% American Indian, 3% Asian, 1% African American, and 2% "other." The majority (61%) were single, with 34% married, 2% separated, and 3% divorced. Almost all (97%) had graduated from high school or received their general educational development diploma, and 31% had received a bachelors degree or higher. Mean time between the T2 and T3 assessments was 6.8 years (*SD* = 1.4). Although women were more likely than men to complete the T3 assessment (89% vs. 81%), X^2 (1, 1,101) = 13.55, $p < 0.001$, T3 participation differences as a function of other demographic variables or T2 diagnostic status were nonsignificant.

2.2 Diagnostic Interviews

Participants were interviewed with a version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) that combined features of the Epidemiological Version (Orvaschel et al., 1982) and the Present Episode version (Chambers et al., 1985) and included additional items to derive diagnoses of past and current psychiatric disorders as outlined in the *DSM-III-R* (American Psychiatric Association, 1987). Table 1 lists the symptoms and clinical characteristics assessed. The majority of the interviewers held advanced degrees in clinical or counseling psychology or social work, completed a 70-hour didactic and experiential course in diagnostic interviewing, and demonstrated a minimum kappa agreement of .80 to an established criterion interviewer (see Lewinsohn et al., 1993, for details).

2.3 Selection of participants for current report

For the current report, we excluded participants who did not meet DSM-III-R criteria for at least one MDD episode during the course of their life. Participants comorbid for non-mood disorders were included in the present study to maintain a representative sample of the general population of individuals experiencing MDD. Because the current investigation focused on the two prioritized symptoms of the DSM MDD phenotype, participants with lifetime histories of dysthymic disorder (*n* = 32; 1.9%) or depressive disorder not otherwise specified (*n* = 415; 24%) were excluded unless they also met lifetime diagnostic criteria for MDD. Participants with lifetime histories of bipolar disorder (*n* = 10; 0.6%) were also excluded.

3. Results

Five-hundred sixty-four participants (371 females) experienced an MDD episode. Forty-six (8%) did not experience sadness, and 159 (28%) did not experience anhedonia. Mean symptom count was 17.2 (*SD* = 4.3; range = 6-32) out of a total of 35 symptoms assessed.

The associations of sadness and anhedonia with other symptoms were assessed by conducting two one-way multiple analyses of variance (MANOVA). In both MANOVAs, symptoms were placed as dependent variables (DVs), excluding the one symptom (i.e., sadness or anhedonia) placed as the independent variable (IV). In the first MANOVA, sadness was entered as the IV; anhedonia was entered as the IV in the second. For each symptom, a dichotomous variable was created representing its absence ("1") or presence ("2").

Gender, age of MDD onset, race, and their interaction terms with the symptom IVs were also entered as predictors in each equation to determine if results differed across these variables. Gender differences existed in symptom presentation in both the equation with sadness as the IV, $F(41, 520) = 1.81$, $P < 0.01$, and the equation with anhedonia as the IV, $F(41, 520) = 3.70$, $P < 0.001$, such that women were more likely than men to display weight loss and crying. In the equation with anhedonia as the IV, women were also significantly more likely than men to display indecision, feelings of worthlessness, physical complaints, and demanding or "clingy" behaviors; men were more likely to display school-related impairments (all F's > 3.8, all P's < 0.05). The interaction of gender and the symptom predictor, however, was not significant in either equation, ($F(41, 520) = .99$, P = ns for sadness; $F(41, 520) = 1.33$, P = ns for anhedonia), suggesting that males and females did not meaningfully differ with regard to how the presence or absence of sadness and anhedonia influenced overall symptom expression. As such, males and females were combined in the following analyses. Neither MDD onset age nor race significantly impacted symptom presentation or interacted with symptom IVs to influence symptom presentation (largest $F = 1.02$, P's = ns). Analyses of symptom IVs were conducted before and after covarying gender, MDD onset age, and race, and results did not meaningfully differ (i.e., after covarying demographic variables, all previously significant predictors remained significant and no previously nonsignificant predictors reached levels of statistic significance).

3.1 Presence versus absence of sadness

Sadness was found to be significantly associated with MDD symptom expression, Wilk's $\Lambda = 0.89$, $F(40, 523) = 1.53$, $P < 0.05$. As shown in Table 2, follow-up univariate analyses of the main effect for sadness revealed that the presence of sadness was associated with higher rates of the following symptoms: reactivity of mood, $F(1, 562) = 12.69$, $P < 0.001$, social impairment, $F(1, 562) = 6.47$, $P < 0.05$, social withdrawal, $F(1, 563) = 5.97$, $P < 0.05$, physical complaints, $F(1, 562) = 5.02$, $P < 0.05$, and terminal insomnia, $F(1, 562) = 4.86$, $P < 0.05$. In contrast, the absence of sadness was associated with higher rates of the following symptoms: diurnal mood variation (worst in the mornings), $F(1, 562) = 5.68$, $P < 0.05$, and hypersomnia, $F(1, 562) = 4.98$, $P < 0.05$. Nonsignificant trends suggested that the presence of sadness may also have been more associated with the presence of hopelessness, $F(1, 562) = 3.02$, $P = 0.08$, and a desire to be dead, $F(1, 562) = 2.99$, $P = 0.08$.

3. 2 Presence versus absence of anhedonia

Anhedonia was also found to be significantly associated with MDD symptomatology, Wilk's $\Lambda = 0.50$, $F(40, 523) = 12.66$, $P < 0.001$. As shown in Table 3, follow-up univariate analyses of the main effect for anhedonia revealed that the presence of anhedonia was associated with higher rates of the following symptoms: social withdrawal, $F(1, 562) = 13.62$, $P < 0.001$, social impairment, $F(1, 562) = 9.49$, $P < 0.01$, reactivity of mood, $F(1, 562) = 8.30$, $P < 0.01$, brooding about past events, $F(1, 562) = 4.14$, $P < 0.05$, and diurnal mood variation (worst in mornings), $F(1, 562) = 4.05$, $P < 0.05$. In contrast, the absence of anhedonia was associated with the following symptoms: increased appetite, $F(1, 562) = 6.14$, $P < 0.05$, and thoughts of death, $F(1, 562) = 5.20$, $P < 0.05$. Nonsignificant trends

suggested that those with anhedonia may also have been more likely to experience loss of appetite, $F(1, 562) = 3.27$, P = 0.07, and weight loss, $F(1, 562) = 3.14$, P = 0.08, and less likely to experience weight gain, $F(1, 562) = 2.99$, P = 0.08 (see Table 2).

As evidenced by Tables 2 and 3, reactivity of mood, social impairment, and social withdrawal are associated with both groups. Additional analyses were conducted to examine whether participants with both sadness and anhedonia demonstrate a greater likelihood to have these symptoms than participants with sadness alone or anhedonia alone. Participants were divided into three groups based on the presence or absence of the two prioritized symptoms (i.e., sadness present-anhedonia absent; sadness absent-anhedonia present; sadness present-anhedonia present). We conducted a MANOVA in which the three groups served as IV's and symptoms served as DV's. The overall model was significant indicating that certain symptoms differed between groups, Wilk's $\Lambda = 0.82$, $F(33, 530) = 1.66$, P < 0.01. The sadness present-anhedonia present group was significantly more likely to exhibit social withdrawal ($F(2, 561) = 10.36$, P < 0.001), reactivity of mood ($F(2, 561) = 8.96$, P < 0.001), and social impairment ($F(2, 561) = 10.45$, P < 0.05) than both the sadness present-anhedonia absent and sadness absent-anhedonia present groups.

4. Discussion

To our knowledge, this is the first study to comprehensively examine differential patterns of depressive symptoms in the presence and absence of the two symptoms prioritized by the DSM for MDD, sadness and anhedonia. These results indicate that there are differences in symptom patterns among participants with sadness versus participants without sadness and that there are different symptom patterns among participants with anhedonia versus those without anhedonia. When compared to participants without sadness, participants with sadness were found to demonstrate significantly greater reactivity of mood, social impairment, social withdrawal, physical complaints, and terminal insomnia and decreased diurnal mood variation and hypersomnia. Further, when compared to participants without anhedonia, those with anhedonia were found to demonstrate significantly greater levels of social withdrawal, social impairment, mood reactivity, brooding about past events, and diurnal mood variation and were less likely to experience appetite increase and thoughts of death.

The findings of the present study are consistent with previous work that has found some differences between individuals with anhedonia versus individuals without anhedonia and significantly adds to anhedonia research in two ways. This study is the first to examine all depressive symptoms associated with the presence or absence of anhedonia. Second, there is a paucity of research examining whether those with sadness differ in symptom expression from individuals without sadness and the present study serves as the first to begin to examine the implications of the DSM's emphasis of this symptom on the remaining depressive symptoms.

As expected, the presence of anhedonia was associated with impaired hedonics in eating and socializing. Appetite loss in depression may be specific to anhedonia. A general loss of interest and pleasure may manifest itself in a specific loss of interest or pleasure in eating. This finding could have implications regarding the high rates of comorbidity between MDD and eating disorders, as there is evidence to suggest that anhedonia may serve as a prodromal symptom of eating disorders (Raffi et al., 2000). The presence of anhedonia was also associated with social withdrawal and impairment, another index of impaired hedonics. The presence of sadness was also associated with these variables, but the effect for anhedonia on these variables was stronger than that for sadness (see Tables 2 and 3).

Both sadness and anhedonia were associated with mood reactivity, but the effect for sadness was stronger (see Tables 2 and 3). The blunting of positive mood associated with anhedonia may account for its relatively weaker association with mood reactivity. Sadness and anhedonia were also differentially associated with diurnal mood variation (worst in the morning). This association is consistent with the syndromality of melancholic depression, defined in part by both the loss of interest or pleasure in nearly all activities and diurnal mood variation, with symptoms worse in the morning (e.g., Kendler, 1997).

The relationship between sadness and desire to be dead is also noteworthy. While the current study relies on correlational data and thus causal inferences cannot be made, future prospective studies could elucidate the mechanisms of this relationship to ascertain whether sadness serves as a risk factor for desire to be dead. This finding also suggests that patients with MDD and sadness should be particularly closely monitored for suicide ideation.

There are limitations to the present study that should be addressed. First, as evidenced in Tables 2 and 3, the results indicate overlap in the symptoms among those with sadness and those with anhedonia such that the three symptoms of reactivity of mood, social impairment, and social withdrawal are associated with both groups (but see points above about relative differences in effect sizes). Additional analyses were conducted to further differentiate these symptoms and revealed that participants with both sadness and anhedonia demonstrate a greater likelihood to have more symptoms than participants with sadness alone or anhedonia alone. This most likely reflects a more severe depressive episode among participants with both sadness and anhedonia. Second, due to the cross-sectional nature of these analyses, causal relationships between the prioritized symptoms and the remaining depressive symptoms cannot be made. Third, the use of retrospective reports of past episodes may have introduced biases due to selective recall. Fourth, as the current sample consists of young adults. As the current diagnostic criteria do not differ for adolescents and adults, we would not expect the presence or absence of sadness or anhedonia to differentially affect children, adolescents, and adults, although future work is necessary to confirm this expectation. Finally, the current studied utilized DSM-III-R criteria for MDD. DSM-IV criteria include significant clinical distress and bereavement rule-out. Future research should investigate whether differences in distress are associated with the presence or absence of sadness or anhedonia to ascertain whether the current findings generalize to current diagnostic criteria for MDD.

Future research could further elucidate the implications of the DSM's emphasis on sadness and anhedonia. While these features are important to differentiate clinically significant MDD from non-specific symptoms associated with medical illness, further research is warranted to understand the implications of each prioritized symptom. Prospective evaluation of depressive symptomatology could determine whether sadness and/or anhedonia play a causal role in the development of associated depressive symptoms. Prospective studies could also determine if the symptom patterns observed in the current study are stable over time.

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Table 1

DSM-III-R Symptoms and K-SADS Clinical Characteristics Examined in the Present Study

Source	Symptom/Characteristic
DSM-III-R Major Depressive Symptoms	Criterion 1: Depressed Mood
	Criterion 2: Anhedonia
	Criterion 3: Weight/Appetite Changes
	Weight Loss
	Weight Gain
	Decreased Appetite
	Increased Appetite
	Criterion 4: Insomnia or Hypersomnia
	Initial Insomnia
	Middle Insomnia
	Terminal Insomnia
	Hypersomnia
	Criterion 5: Pyschomotor Agitation or Retardation
	Psychomotor Agitation
	Psychomotor Retardation
	Criterion 6: Fatigue/Loss of Energy
	Criterion 7: Worthlessness or Excessive Guilt
	Worthlessness
	Excessive Guilt
	Criterion 8: Diminished ability to think or concentrate or indecisiveness
	Concentrating/Thinking
	Indecision
	Criterion 9: Recurrent thoughts of death or suicidal ideation
	Thoughts of Death
	Wishing to be Dead
	Suicidal Ideation
K-SADS Clinical Characteristics	Tearfulness/Crying
	Brooding about Past Experiences
	Self-Pity
	Diurnal Mood Variation: Worst in AM
	Diurnal Mood Variation: Worst in PM
	Irritability/Anger
	Hopeless/Pessimistic
	Physical Complaints
	Demandingness/Clinging
	Social Withdrawal

Source	Symptom/Characteristic
	Reactivity of Mood
	Evidence of a Precipitant
	Impairment (Socially)
	Impairment (With Family)
	Impairment (In School)

Table 2

Symptoms Correlated with the Presence or Absence of Sadness

Depressive Symptom	df	F	P
Presence of Sadness			
Reactivity of Mood	1, 562	12.69*	< 0.001
Social Impairment	1, 562	6.47*	< 0.05
Social Withdrawal	1, 563	5.97*	< 0.05
Physical Complaints	1, 562	5.02*	< 0.05
Terminal Insomnia	1, 562	4.86*	< 0.05
Hopelessness	1, 562	3.02	0.08
Desire to be Dead	1, 562	2.99	0.08
Absence of Sadness			
Diurnal Mood Variation (worst in the mornings)	1, 562	5.68*	< 0.05
Hypersomnia	1, 562	4.98*	< 0.05

*$P<0.05$.

Table 3

Symptoms Correlated with the Presence or Absence of Anhedonia

Depressiv Symptom	df	F	P
Presence of Anhedonia			
Social Withdrawal	1, 562	13.62*	< 0.01
Social Impairment	1, 562	9.49*	< 0.01
Reactivity of Mood	1, 562	8.30*	< 0.01
Brooding about Past Events	1, 562	4.14*	< 0.05
Diurnal Mood Variation (worst in the mornings)	1, 562	4.05*	< 0.05
Loss of Appetite	1, 562	3.27	0.07
Weight Loss	1, 562	3.14	0.08
Absence of Anhedonia			
Increased Appetite	1, 562	6.14*	< 0.05
Thoughts of Death	1, 562	5.20*	< 0.05
Weight Gain	1, 562	2.99	0.08

*$P<0.05$.