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Depression and somatic complaints among male juvenile offenders: Differentiating somatizers from non-somatizers with the Millon Adolescent Clinical Inventory (MACI)

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Abstract
A review of the current literature suggests that comorbidity exists between depression, somatization, and suicidal ideation among behaviorally disruptive adolescents. A study was designed to determine how these clinical characteristics and other clinical indicators measured by the Millon Adolescent Clinical Inventory differentiate between male detained juvenile offenders who somatize and those that do not. A combination of analysis of variance tests and predictive and discriminant analyses were employed. Results revealed that depressive affect, self-devaluation, dolefulness, and suicidal tendencies significantly discriminated between somatizers and non-somatizers. A total of 71.1% of the participants were correctly classified as a somatizer or non-somatizer using a function of these variables. Results are discussed in light of how the presence of somatization in this population can indicate a need for mental health intervention for symptoms and syndromes of depressive disorders and suicidal risk.

Keywords: *Juvenile Offenders, delinquency, somatization, suicide*

Reviews of the current population of juvenile offenders showed that 60% of the children in the juvenile justice system have mental health problems and 20% of these are severely mentally ill (Yee, 2000). Pliszka, Sherman, and Barrow (2000) administered the Diagnostic Interview Schedule for Children to adolescents detained at a juvenile detention center and found that 42% had an affective disorder, 20% met criteria for mania, and 10%

met diagnostic criteria for major depressive disorder, and a significant relationship was found between affective disorders and conduct disorders. Martin, Sigda, and Kupersmidt (1998) surveyed incarcerated children using the Children's Depression Inventory and found that more than 70% had clinically relevant symptoms of depression. The fact that many youths in the juvenile justice system bounce back and forth between treatment centers may contribute to the high prevalence rate of mental health problems and negatively impact their ability to receive adequate treatment (Briscoe, 1996). Although there are insufficient national data regarding the incidence of youth suicide in custody, information suggests a high prevalence of suicidal behavior in juvenile correctional facilities. According to a study funded by the Office of Juvenile Justice and Delinquency Prevention, more than 11,000 juveniles engage in more than 17,000 incidents of suicidal behavior in juvenile facilities each year (Parent et al., 1994). Alessi, McManus, Brickman, and Grapentine (1984) found that incarcerated youth with either major affective disorders or borderline personality disorders had a higher degree of suicidal ideation and more suicide attempts than comparable adolescents in the general population.

Among the mood disorders, depression appears to be the most prevalent. However, Stanard (2000) reported that depression can sometimes be difficult to diagnose in adolescents because the symptoms present differently relative to children and adults. The symptoms may present initially as substance abuse, a conduct disorder or 'rebellion' without typical symptoms of depression. Major depressive episodes can be missed diagnostically due to the symptom presentation meeting criteria for disruptive behavior disorders, attention-deficit disorders, anxiety disorders, substance-related disorders, and eating disorders. Stanard (2000) reports that male adolescents express symptoms that appear to be behavior disruptive disorders, which are also associated with suicidal behaviors in this group. Aggressive behaviors in young males are related to high-risk behaviors and suicide, which may be misdiagnosed as conduct disorder or another behavior disruptive disorder. Cole (1989) studied a group of male juvenile offenders in a detention facility and investigated indicators of suicidal behaviors. This study found that the factor most associated with suicidal behaviors in adolescent males of this population was their sense of self-efficacy in coping abilities.

Further, the expression of the symptoms of depression in male adolescents is often different from their expression in children, adults, and female adolescents. Compas, Sydney, and Grant (1993) found that somatic complaints are important indicators of the severity of depression in adolescents. These researchers argued that a change in function in biological responses to stress and coping occurs during adolescence and may contribute to biological or somatic symptoms. A review of the existing literature suggests that somatization could be an important indicator of

depressive disorders in adolescent males. The current study evaluates whether somatic symptoms in male adolescent offenders are related to elevations in clinical scales of depressive affect, dolefulness, self-devaluation, and suicidal tendencies.

Among adolescents, there appears to be an important connection between depressive symptoms, suicidal tendencies, and somatic complaints. Several studies have demonstrated that a relationship exists between somatization and symptoms common to depression (Bernstein, Massie, & Thuras, 1997; Cavaiola & Lavender, 1999; Choquet & Kovess, 1993; Dhossche, Ferdinand, van der Ende, & Verhulst, 2001; Patton, Coffey, Posterino, Carlin, & Wolfe, 2000; Schonfeld, 2002). Velting, Rathus, and Miller (2000) report that the Millon Adolescent Clinical Inventory (MACI; Millon, 1993) can be quite useful in determining suicidality if the scales reflecting anger control issues and aggressive tendencies are explored for adolescents who are depressed outpatients. However, clinical indicators measured by the MACI may be more useful in differentiating groups of adolescents if the variables are considered simultaneously (Romm & Bockian, 1999).

The purpose of the current study was to determine whether or not medically-identified somatizers and non-somatizers could be differentiated on the basis of clinical characteristics related to depression. Specifically, we were interested in a profile of clinical characteristics identified by the MACI that could classify male detained juvenile offenders at a rate greater than that which can be expected by chance, and provide valuable clues as to how to respond to and treat somatization cases within this population. The presence of somatization in this population can indicate a need for mental health intervention for symptoms and syndromes of depressive disorders and suicidal risk. We hypothesized that somatizers could be differentiated from non-somatizers on the basis of eight MACI measures closely related to depression, and that a linear disciminant function of these variables could be used to classify participants correctly as somatizers and non-somatizers at a rate greater than that which can be expected by chance. Analysis of variance (ANOVA) tests and descriptive and predictive discriminant analyses were employed to examine these hypotheses.

Method

Participants

Participants consisted of 83 juvenile males whose mean age was 15.47 ($SD = 1.04$). Of the 83 participants, 44 were African-American (53.0%), 26 were Caucasian (31.3%), 4 were Hispanic (4.8%), and 9 (10.9%) did not list their race. The participants were all detained in a regional youth detention center. The participants' mean number of adjudicated offenses was 2.44 ($SD = 1.37$). Offenses included, but were not limited to, probation

violation, drug and alcohol possession, battery, burglary, vehicle theft, terroristic threats, vandalism, and sexual assault.

Instrument: Millon Adolescent Clinical Inventory (MACI)

The MACI (Millon, 1993) is a standardized, self-report personality inventory consisting of 160 true – false statements. The inventory is specifically designed to assess adolescent personality characteristics and clinical syndromes in adolescents between the ages of 13 and 19 in clinical settings. The MACI consists of: 12 personality patterns that parallel commonly diagnosed personality disorders; eight expressed concerns that measure feelings and attitudes that often concern most troubled adolescents; seven clinical syndromes that may indicate the presence of disorders most frequently found among adolescent populations; and three modifying indices (disclosure, desirability, and debasement) that measure response styles and test-taking attitudes.[1] Adequate test – retest reliability and internal consistency has been reported for each subscale (Millon, 1993). Cronbach's alphas for each of the MACI subscales have been recorded above .80, and test – retest reliability coefficients (r) above .80.

Procedure

The MACI was administered while the participants were in detention as part of an initial screening for mental health issues. Medical staff nominated youths as somatizers or non-somatizers based on their clinical interaction with the youth. Each participant was determined to be a somatizer or a non-somatizer based on the number and type of visits he made to the nurses' station within the 30 days following admission to the detention facility. Nurses recorded the date of each visit and documented the specific complaint for each youth. Typical somatic complaints included, but were not limited to: headache; stomachache; back pain; acne; sore throat; toothache; fatigue, insomnia; and dizziness. Three different judges, possessing knowledge of common symptoms of somatoform disorders, determined the dichotomous variable (somatizer vs. non-somatizer) for each participant on which the results are based. Each judge was asked to examine the documentation of visits to the medical staff for each youth before making their decision. Agreement among the judges was 97.5%; in two cases of disagreement, the third judge was used to determine the appropriate somatization group.

Ethical considerations

This study was conducted under the purview of the University of Georgia's Institutional Review Board in cooperation with the State of Georgia Department of Juvenile Justice.

Analyses

The primary objective of the current study was to identify differences between two groups of juvenile offenders in terms of particular clinical indicators measured by the MACI. This task can be accomplished using common between-group statistical analyses, such as ANOVA. However, stopping at between-group differences does not provide a statistical evaluation of which differences are most pertinent to differentiating the groups. The degree to which selected MACI scales discriminate between the two groups and the categorization of the scales that contribute to the discrimination can be accomplished through discriminant analysis procedures (Betz, 1987). This approach aids in determining the essential differences between the groups by statistically controlling for multiple variables. Thus, descriptive discriminant analysis (DDA) and predictive discriminant analysis (PDA), otherwise known as classification analysis (Huberty, 1984), were employed.

Although each scale of the MACI provides an important piece of information about an adolescent, it would be an extremely liberal statistical test to include each of these scales as predictor variables of somatization. In the current study, we used only those scale which we hypothesized would have a strong relation to somatization in adolescent male juvenile offenders, which included: doleful (depressive); self-demeaning (masochistic or self-defeating); identity diffusion; self-devaluation; substance-abuse proneness; anxious feelings; depressive affect; and suicidal tendency. We first determined how well these MACI scales generally differentiated between somatizers and non-somatizers without controlling for each potential predictor. The results of these tests were also used to determine the set of predictors used in the discriminant analyses. Huberty (1994) recommends using variables that reach an F value greater than 1.00 in an ANOVA, rather than using p values as a screening criterion for discriminant predictor variables. This approach provides specific information that discriminates between somatizers and non-somatizers while statistically controlling for all of the predictors simultaneously.

Results

Preliminary analyses

The procedures to identify the two groups resulted in 32 somatizers and 51 non-somatizers. Somatizers made significantly more visits to the medical staff with somatic complaints ($M = 3.97$, $SD = 1.82$) than did non-somatizers ($M = .47$, $SD = .67$), $F[1 , 81] = 155.08$). Although this result was expected, it does provide some assurance that participants identified as

somatizers did in fact present with clinical symptoms common to somatization.

Descriptive statistics ANOVA results across selected MACI scales for the total sample by somatization group are displayed in Table I. Not surprisingly, on average somatizers scored higher than did non-somatizers on each of the MACI scales examined; among the doleful, self-demeaning, self-devaluation, depressive affect, and suicidal tendency scales, these results were statistically significant. Thus, the ANOVA results suggest that somatizers have a distinct profile of clinical indicators when compared to non-somatizers. Results of the DDA are presented in Table II.

Classification of cases

Using classification analysis, also referred to as PDA, we were able to test whether or not the two groups could be classified into somatizers and non-somatizers on the basis of their selected MACI profile scores at a rate greater than that expected by chance. It was found that 71.1% of the cases were correctly classified in terms of somatization group (see Table III). Cohen's kappa coefficient between the predicted and actual group membership was .38 ($p < .001$). Three standard normal statistics (Huberty, 1994) were also computed to determine whether the observed classification accuracy was better than what may be expected by chance for each group and the entire sample. These statistics are calculated using estimated prior probabilities, group participant sizes, and observed frequencies. The prior probability of the somatizer group was .39, and the percentage of somatizers correctly classified was 59.4% ($z = 2.36$, $p < .02$). For non-somatizers, the

Table I. Means, standard deviations, and analysis of variance test results for male juvenile offender somatizers and non-somatizers on MACI subscales selected for DDA and PDA.

MACI subscale	Somatizers ($n = 32$)		Non-somatizers ($n = 51$)		
	M	*SD*	*M*	*SD*	*F*
Doleful	67.69	22.57	49.61	24.77	11.20**
Self-demeaning	53.41	21.49	41.69	22.36	5.57*
Identity diffusion	50.63	21.60	44.00	17.50	2.35
Self-devaluation	55.59	22.98	41.08	22.51	8.05*
Substance abuse proneness	66.47	28.90	59.39	30.84	1.08
Anxious feelings	52.76	20.44	47.81	14.95	1.40
Depressive affect	67.66	24.60	50.71	28.43	7.73*
Suicidal tendency	39.38	22.14	28.16	21.81	5.14*

Note: MACI = Millon Adolescent Clinical Inventory; DDA = descriptive discriminant analysis; PDA = predictive discriminant analysis; *$p < . 05$; **$p < . 01$.

Table II. Correlation of MACI subscales with discriminant functions and standardized discriminant function coefficients.

Predictor variable	Correlation with discriminant function	Standardized discriminant function coefficients
Doleful	− .76	− .88
Self-demeaning	− .53	.29
Identity diffusion	− .35	.38
Self-devaluation	− .64	− .25
Substance abuse proneness	− .26	.51
Anxious feelings	− .27	.96
Depressive affect	-.63	-.47
Suicidal tendency	-.51	-.05

Table III. Classification analysis summary for male juvenile offender somatizers and non-somatizers.

Actual category	*n*	Predicted category	
		Somatizer	Non-somatizer
Somatizer	32		
n		19	13
%		59.4	40.6
Non-somatizer	51		
n		11	40
%		21.6	78.4

Note: Overall percentage of correctly classified cases = 71.1%.

prior probability was .61, and the percentage of non-somatizers correctly identified was 78.4% ($z = 2.55$, $p < .01$). For the entire sample, 71.1% of the cases were correctly classified ($z = 3.84$, $p < .001$; with the prior probability at .50). These findings suggest that the obtained classification results greatly exceeded chance probability. It is also worth noting that the classification hit rate increased to an even more impressive 96.4% when we statistically controlled for the number of visits to the nurses' station.

Discussion

By pre-selecting MACI scales and subjecting them to a discriminant function analysis strategy, this study identified that male juveniles who somatize, and those who do not, varied as a function of specific clinical concerns. The current study also demonstrates the ability of the MACI to discriminate between somatizers and non-somatizers. In addition, the

limited amount of information used to compose the linear discriminant functions adds to the practical significance of taking evidence of somatoform symptoms more seriously.

Results showed that the percentage of correctly classified cases (71.1%) greatly exceeds that which was expected by chance. More specifically, both univariate and discriminant findings suggest that juvenile offenders who are more doleful, self-demeaning, and self-devaluing, and have a tendency to present with a depressive affect and suicidal tendencies, may be more likely to somatize while detained in a detention center. Relatively higher scores on these scales among somatizers suggest that some detained male juvenile offenders are markedly depressed and that their depression is manifested in a somatic form. These results are consistent with somatic symptoms common to depressive episodes (e.g., insomnia, fatigue, weight loss). However, because somatization has been linked to suicidal tendencies, the current findings suggest that male juvenile offenders who somatize may be in great need of immediate care.

Discriminant function analysis allows for a deeper understanding of how juvenile offenders differ with respect to their somatic complaints (or lack thereof) by providing a meaningful piece of the clinical picture of each somatization category. Further, these findings of distinct groups support current differential treatment approaches that specifically address somatic symptoms and related psychopathology. Information about common clinical characteristics may be particularly helpful to clinicians concerned with interventions designed for juvenile offenders. One obvious potential use of the findings from the current study is appropriate application to treatment interventions. For example, among those detained in the UK, suicide rates among young men in prison are increasing, and very young prisoners (15 – 17 years old) are over-represented in the prison suicide figures (Hales, Davison, Misch, & Taylor, 2003). Therefore, it may be important, on admission, to identify detained youths with these symptoms so that potential suicidal behaviors can be addressed. While the ratio of the number of participants to the number of predictor variables was not ideal, further research with larger sample sizes can explicate the effects of such variables as race, level of offense, level of intelligence, age, etc.

The current report suggests that the MACI is useful in discriminating between somatizers and non-somatizers. The clinically significant elevation on the majority of the MACI scales examined (evidenced by the large standard deviations) appears to provide additional practical relevance. Somatizers may not only be differentiated by the frequency and types of complaints that they report to the medical staff, but also by their depressive symptoms that are readily identifiable.

In light of the recent emphasis on gender-specific programming, the current study is an illustration of how the male adolescent is unique in the presentation of symptoms of depression, suicidal tendencies, and self-

devaluation. During the development of the male adolescent, the expression of negative affect and other issues of depression may appear quite different from traditionally expected manifestations. As a result, many male adolescents are simply misunderstood and classified with behavioral problems. This dynamic may be especially important among populations that are expected to receive some form of behavioral rehabilitation. What remains critical to this system are effective evaluations and assessments that illustrate the issues these offending youth are facing. Treatment of clinical disturbances may improve the chances of the youthful offender functioning in society, but it is likely that appropriate treatment will only follow accurate evaluation and diagnosis (Garland & Zigler, 1993; Halikias, 2000; Morgan & Hawton, 2004).

General conclusions

Depressive symptomatology, as measured by the MACI, adequately captured the differences between somatizers and non-somatizers in a sample of detained male juvenile offenders. Aside from accurately classifying somatizers and non-somatizers at a rate greater than that which was expected by chance, this study also offers a deeper understanding of adolescent somatization by providing valuable information in regard to the clinical differences between male juvenile offending somatizers and non-somatizers. Such information may prove to be important for clinicians working with male juvenile offenders. Finally, the current study may serve as a basis for screening for symptoms apparently related to adolescent somatic complaints that may meet more timely and appropriate interventions.

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Note

1 McCann (1997) identified configurations of the modifying indices that may indicate invalid administrations of the MACI. These configurations were employed to guide the elimination of data from the analysis: two participants' data were eliminated due to reliability scale scores greater than zero; three participants' data were eliminated due to desirability scale scores greater than 90; three participants' data were eliminated due to debasement scale scores greater than 90; and two participants' data were eliminated due to having both desirability and debasement scale scores greater than 75.

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