Differences in Rates of Depression in Schizophrenia by Race

by Janine Delahanty, Ranganathan Ram, Leticia Postrado, Theodora Balis, Lisa Green-Paden, and Lisa Dixon

Abstract

The purpose of this study was to determine whether demographic and clinical factors are associated with a diagnosis of depression among persons with schizophrenia and to determine the association of depression with subjective quality of life. A consecutively admitted sample of psychiatric inpatients diagnosed with schizophrenia (n = 123) were assessed for depression and quality of life. Logistic regression was used to determine factors associated with a diagnosis of depression. Multiple regression analyses were used to determine the relationship between depression and quality of life. The odds of being diagnosed with depression were seven times greater in Caucasians than in African-Americans, and three times greater in persons who were ever married. Depression was significantly associated with reduced life satisfaction in Caucasians but not African-Americans. This suggests the importance of race as a predictor of a diagnosis of depression in schizophrenia and the possibility of underdiagnosis of depression among African-Americans. The absence of the expected association between depression and quality of life in African-Americans casts doubt on the validity of the depression diagnosis using conventional diagnostic tools.

Keywords: Depression, schizophrenia, racial differences, quality of life, diagnosis, SCID-P.


A number of systematic studies of persons suffering from schizophrenia have observed that there is often a significant co-occurrence of depression (Siris 1995). The clinical difficulty in differentiating affective syndromes with psychosis from nonaffective psychosis was recognized by Kraepelin (1919) and subsequently by many others (Bleuler 1950). Depression is difficult to distinguish from negative symptoms, substance-induced disorders, and bipolar and other affective disorders in schizophrenia. There have been several attempts to validate the distinction between overlapping syndromes of depression and schizophrenia through careful study of the phenomenology of the two syndromes and their relationship to outcome (Becker et al. 1985; Herrman 1987; Kay and Lindenmayer 1987; Leff 1990; Rogers and Winokur 1990; Taylor 1992; Liddle et al. 1993; Jeste et al. 1996), or through family studies (Kendler and Hays 1983; Hirsch et al. 1990). However, a careful review of this literature reveals that controversy still exists in defining the extent of depression in schizophrenia and its effect on prognosis.

Followup and cross-sectional studies of persons with schizophrenia reveal a wide range of depression rates. The prevalence varies between 7 percent and 70 percent with a modal range of 25 percent (Siris 1995). The variation in the prevalence rates may be due to methodological and sampling differences as well as differences in the definitions of both schizophrenia and depression that are employed in the various studies. Little is known about the relationship of race and other social factors such as marital status and educational level to the risk of depression in schizophrenia.

Since past research has found a substantial impact of race on the diagnosis of affective disorders versus psychotic disorders, race is likely to be an important variable in the diagnosis of depression in persons who have schizophrenia. African-Americans, especially men, are diagnosed with a lower prevalence of mood disorders and...
higher prevalence of schizophrenia than Caucasians (Bell and Mehta 1980, 1981; Adeebimpe 1981, 1994; Jones and Gray 1986; Keith et al. 1991; Strakowski et al. 1993; Kessler et al. 1994; Kilgus et al. 1995; Rayburn and Stonecypher 1996). These differences could reflect erroneous diagnoses or true differences in prevalence, though more recent data suggest that the former explanation is more likely (Keith et al. 1991; Kessler et al. 1994). Possible explanations for the erroneous prevalence rates and misdiagnoses include differences in the presentation of symptoms and the interpretation of these symptoms by predominantly Caucasian clinicians (Neighbors et al. 1989; Crowley and Simmons 1992; Leda and Rosenheck 1995; Klinkenburg and Calsyn 1997), differences in treatment-seeking behavior affected by culture (Cole and Pilisuk 1976; Crowley and Simmons 1992; Strakowski et al. 1993; Callan 1996), and treatment referral bias (Cuffe et al. 1996) on the part of Caucasian professionals. Low cultural competence of clinicians could play a role (Schooler et al. 1974; Cole and Pilisuk 1976; Haimo and Holzman 1979; Crowley and Simmons 1992). Other possible causes of erroneous diagnosis include unbalanced representation in research samples (Neighbors et al. 1989), inaccuracy or bias of psychological tests (Grier and Cobb 1968; Neighbors et al. 1989), and failure of some studies to control for socioeconomic status, education, and urban residence (Grier and Cobb 1968; Cole and Pilisuk 1976; Rothman and Dubin 1982; Somervell et al. 1989). The extent to which these issues influence the diagnosis of depression within schizophrenia is unknown.

The literature also reveals some confusion regarding how a diagnosis of depression affects prognosis and outcome in schizophrenia (Becker et al. 1985; Herrman 1987; Kay and Lindenmayer 1987; Leff 1990; Rogers and Winokur 1990; Taylor 1992; Liddle et al. 1993; Jeste et al. 1996). Vaillant (1964) reported that the presence of depression confers a favorable prognosis in schizophrenia. However, more recent studies have suggested that depression is a precursor of relapse (Herz and Melville 1980; Becker 1988), may increase the risk for rehospitalization (Herz and Melville 1980), and is likely to be associated with demoralization, hopelessness (Drake and Cotton 1986), and impaired psychosocial skills (Glazer et al. 1981). Most important, the presence of depression may put the patient with schizophrenia at risk for suicidal thoughts and, ultimately, completion of a suicide attempt (Addington and Addington 1992). Therefore, accurate identification of depression among patients with schizophrenia is vital.

The impact of depression on quality of life is especially important to examine given that previous work has established a link between reduced quality of life and depression in the absence of schizophrenia. This association was found in studies of diverse groups of individuals including groups of people with serious and persistent mental illnesses (Lehman 1988; Sullivan et al. 1992; Endicott et al. 1993; Mechanic et al. 1994; Corrigan and Buican 1995). Mechanic et al. (1994) found that the presence of symptoms of depression had an independent negative effect on quality of life. Race and ethnicity may also affect quality of life. Most studies show that Caucasians report greater life satisfaction (Campbell et al. 1976; Redmond 1988); however, Lehman et al. (1995) found that non-Caucasians exhibited greater life satisfaction. No prior research to our knowledge has focused on the association of depression with quality of life in schizophrenia.

The objective of this study was to explore the role of depression in schizophrenia. Specifically, we aimed to determine the relationship between a diagnosis of depression in schizophrenia and race and other demographic and clinical factors. Second, we aimed to determine if depression reduced quality of life in this same group.

Method

Procedure. All admissions to two inner-city psychiatric hospitals, one State operated and the other university operated, were screened between April 1988 and December 1990. These two hospitals are the principal psychiatric facilities serving an urban catchment area of approximately 160,000. The area consists of a large minority population (54% African-American), and many in the area live below poverty level (25%). Inclusion criteria for all subjects in the study were (1) aged 18-65, (2) a current resident of the catchment area, (3) able to speak English, (4) not currently a ward of the criminal justice system, and (5) legally and medically competent to give informed consent. The study was restricted to persons living in the catchment area in order to provide a more representative sample of all nonelderly adults experiencing a psychiatric admission from a defined geographic region. Only persons with a diagnosis of schizophrenia were considered in these analyses.

All patients were screened within 1 week after admission. Those meeting the study criteria were approached about the study as soon as their clinical condition rendered them able to give consent and to participate in the research diagnostic evaluation. All subjects provided written informed consent and were advised at the time of consent that the information provided would be protected by a Federal Certificate of Confidentiality.

A total of 435 patients who were admitted to the two psychiatric hospitals during the 30-month recruitment period entered the study. The overall consent rate was 71 percent. Participants did not differ from nonparticipants on gender, race, or length of hospital stay; however, participants were younger than nonparticipants (mean ages
33 vs. 36 years) and nonparticipants had higher rates of schizophrenia spectrum disorders. All subjects were paid $10 for their participation.

**Measures**

**Structured Clinical Interview for DSM-III-R, Patient Version (SCID-P).** The SCID-P assesses current (past month) and lifetime DSM-III-R Axis I diagnoses. SCID-P diagnoses were based upon face-to-face interview and review of the patient’s clinical record. The interrater reliability (kappa) for the SCID principal diagnosis in this study was 0.81. SCID diagnoses were used to determine the presence of current schizophrenia as well as lifetime substance use disorder. Patients were considered to have current depression if they met at least five of the nine criteria for major depression on the SCID. All patients with a lifetime diagnosis of depression also met criteria for current depression.

As discussed extensively elsewhere (Lehman et al. 1994), the SCID was modified in this study to distinguish patients thought to have an independent mental disorder not due to substances from those with a mental disorder that was due to substances. This study included only those individuals with a diagnosis of schizophrenia that was definitely not due to a current substance use disorder.

**Lehman Quality of Life (QOL) Interview.** The Lehman (1988) QOL Interview is a 45-minute structured patient interview designed to assess the life circumstances of persons with severe mental illnesses, both in terms of what they actually experience (objective quality of life) and their feelings about their experiences (subjective quality of life). This study focuses on the subjective quality of life indicators for several areas, including living situation, family relations, social relations, daily activities, finances, and safety. All of the subjective QOL satisfaction items use a fixed interval (1–7) Terrible–Delighted Scale. The scale is scored so that 1 (terrible) indicates “the worst,” 4 (mixed) indicates “about equally satisfied and dissatisfied,” and 7 (delighted) indicates “the best.”

**Sample.** A total of 123 patients with a primary DSM-III-R Axis I diagnosis of schizophrenia were considered for this study. Forty-four (35.8%) of these individuals met criteria for major depression. Table 1 presents the demographic and clinical characteristics of this sample.

**Data Analysis.** Of the demographic characteristics, only age and educational level were continuous variables. The remaining demographic variables were evaluated as two-level factors. Marital status was defined as ever-married (married, widowed, divorced, separated, or cohabited) or never married. Race was defined as Caucasian or African-American (one person who was Hispanic was not included in the non-Caucasian group). The clinical measure was also dichotomous. A comorbid lifetime substance use disorder was either present or absent.

To assess the relationship of race and other sociodemographic and clinical variables with a diagnosis of depression, bivariate associations between depression and categorical variables (gender, race, marital status, and substance use disorder) were assessed with / tests (2-tailed). For continuous demographic variables such as age

### Table 1. Sample demographics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total*</th>
<th>Depressed</th>
<th>Not depressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (%)</td>
<td>n = 118</td>
<td>n = 44</td>
<td>n = 74</td>
</tr>
<tr>
<td>Male</td>
<td>65.3</td>
<td>56.8</td>
<td>70.3</td>
</tr>
<tr>
<td>Female</td>
<td>34.7</td>
<td>43.2</td>
<td>29.7</td>
</tr>
<tr>
<td>Marital status** (%)</td>
<td>n = 118</td>
<td>n = 44</td>
<td>n = 74</td>
</tr>
<tr>
<td>Never married</td>
<td>67.8</td>
<td>52.3</td>
<td>77.0</td>
</tr>
<tr>
<td>Ever married</td>
<td>32.2</td>
<td>47.7</td>
<td>23.0</td>
</tr>
<tr>
<td>Race*** (%)</td>
<td>n = 113</td>
<td>n = 43</td>
<td>n = 70</td>
</tr>
<tr>
<td>Caucasian</td>
<td>27.4</td>
<td>51.2</td>
<td>12.9</td>
</tr>
<tr>
<td>African-American</td>
<td>72.6</td>
<td>48.8</td>
<td>87.1</td>
</tr>
<tr>
<td>Substance abuse (%)</td>
<td>n = 123</td>
<td>n = 40</td>
<td>n = 76</td>
</tr>
<tr>
<td>None</td>
<td>32.5</td>
<td>31.8</td>
<td>32.9</td>
</tr>
<tr>
<td>At least one</td>
<td>67.5</td>
<td>68.2</td>
<td>67.1</td>
</tr>
<tr>
<td>Age (yrs)</td>
<td>n = 118</td>
<td>n = 44</td>
<td>n = 72</td>
</tr>
<tr>
<td>Mean</td>
<td>34.0</td>
<td>36.3</td>
<td>33.2</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>9.24</td>
<td>8.97</td>
<td>8.63</td>
</tr>
<tr>
<td>Education (yrs)</td>
<td>n = 116</td>
<td>n = 44</td>
<td>n = 72</td>
</tr>
<tr>
<td>Mean</td>
<td>10.7</td>
<td>10.6</td>
<td>10.8</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>2.3</td>
<td>2.3</td>
<td>2.3</td>
</tr>
</tbody>
</table>

* The sample size varies because of missing data; ** $\chi^2 = 6.65$, df = 1, $p = 0.010$; *** $\chi^2 = 17.76$, df = 1, $p = 0.001$. 
and education level, Pearson’s $r$ (2-tailed) was used. Initially, collinearity between covariates was examined using the chi-square or the $t$ test as appropriate. These methods were also used to assess the relationship of each covariate (clinical and demographic factors) with the response variable (depression). To test the power of race as a predictor of depression, stepwise logistic regression analysis was conducted including all of the demographic and clinical factors. Our criterion $p$ value for entry and for staying in the model was set at 0.05.

To assess the relationship between depression and QOL, bivariate associations between subjective QOL and demographic factors, substance use disorder, and depression were computed using Pearson’s $r$. Then, to determine if the presence of depression was associated with reduced QOL when controlling for other factors, multiple regression analyses were conducted. The presence of depression, substance use disorder, and the demographic factors were regressed on each of the QOL indicators. Tests assessing the relationship between QOL indicators and depression were 1-tailed, consistent with our hypotheses.

Results

Factors Associated with Depression in Schizophrenia. Bivariate analyses assessing the potential association between depression in schizophrenia and demographic factors (age, gender, race, marital status, and educational level) as well as the clinical factor (substance abuse comorbidity) revealed that being Caucasian ($r = 0.42; df = 112; p < 0.001$) and having ever been married ($r = 0.26; df = 116; p < 0.005$) were significantly associated with the presence of depression.

Logistic regression that modeled the presence of depression and included all of the independent variables was conducted. This revealed that race and marital status were significantly associated with depression when the other covariates were held constant. Caucasians were much more likely to be diagnosed with depression (odds ratio = 7.7, $p < 0.001$). Persons who had ever been married were also more likely to be diagnosed with depression (odds ratio = 2.8, $p < 0.05$). Additional tests for interactions found no evidence of an interaction between marital status and gender.

Depression and Quality of Life in Schizophrenia. We examined the association between depression and subjective quality of life. Bivariate analyses revealed that depression was significantly associated with reduced overall (global) satisfaction with life ($r = -0.32; df = 116; p < 0.001$), reduced satisfaction with leisure activities ($r = -0.21; df = 115; p < 0.05$), reduced satisfaction with living situation ($r = -0.19; df = 111; p < 0.05$), reduced satisfaction with safety ($r = -0.26; df = 116; p < 0.005$), and reduced satisfaction with social relations ($r = -0.34; df = 115; p < 0.001$). African-Americans reported less satisfaction with overall (global) quality of life ($r = -0.24; df = 112; p < 0.05$) and less satisfaction with daily activities ($r = -0.20; df = 112; p < 0.05$).

Multivariate analyses that included demographic variables, substance use disorder, and depression as predictors of subjective quality of life yielded significant $F$ values for two models: overall (global) life satisfaction and satisfaction with social relations (table 2).

The presence of depression was significantly associated with lower satisfaction with social relations ($F = 3.56, df = 103, p < 0.01$) and with lower overall life satis-

<table>
<thead>
<tr>
<th>Table 2. Results of regression analyses on quality of life domains</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standardized Regression Coefficients</strong></td>
</tr>
<tr>
<td>Independent variables</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Highest grade completed</td>
</tr>
<tr>
<td>Ever married</td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td>Substance abuse</td>
</tr>
<tr>
<td>Depression</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
</tr>
<tr>
<td>F value</td>
</tr>
<tr>
<td>df</td>
</tr>
</tbody>
</table>

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

* Adjusted $R^2$ is an indicator of the proportion of variance explained by the model.
faction (F = 3.34, df = 103, p < 0.01) in these models. Lower educational attainment was also associated with reduced quality of life. This model did not significantly predict satisfaction with daily activities, satisfaction with family, satisfaction with finances, satisfaction with living situation, or satisfaction with safety. Depression was also significantly associated with lower satisfaction with safety; however, the overall F value was nonsignificant.

Further multivariate analysis was conducted to test for an interaction between race and depression and revealed a significant interaction (β = -0.37; p < 0.05). Separate multivariate analyses were then conducted for Caucasians and African-Americans. The results indicated that for Caucasians, the effect of depression on global QOL was highly significant (β = -0.58; p < 0.001), as was the presence of substance abuse (β = -0.64; p < 0.001), whereas for African-Americans, both depression and substance abuse were not significant.

We examined the means and standard deviations of the scores on QOL domains of African-Americans and Caucasians to determine if the significant association found among Caucasians was influenced by greater variability of scores on the dependent variables. African-Americans have a higher mean score and a lower standard deviation (SD) on global satisfaction (see table 3). However, such a difference in SD (0.2 or one-fifth of a SD) was small and comparable with other domains and was not statistically significant based on an F test for two variances. We thus do not think the constriction of score ranges for the African-American sample explains the lack of association found for African-Americans and the subjective QOL domains.

Discussion

Although this study is limited by its study of inpatients in only a single city, it provides compelling evidence that race and marital status are important predictors of being diagnosed with depression among persons with schizophrenia. The odds of having a diagnosis of depression in this study that used a standardized research instrument were almost eight times greater for Caucasians than for African-Americans. The odds of having a diagnosis of depression were three times greater for persons who were ever married.

The higher risk of depression diagnosis in Caucasians is consistent with previous literature reporting lower rates of diagnosis of affective disorders in African-Americans relative to Caucasians. This study extends those findings to a population of persons diagnosed with schizophrenia. The conclusion that the actual prevalence of depression is lower in African-Americans than in Caucasians does not necessarily follow. Possible explanations for our findings are similar to the potential reasons for overdiagnosis of psychotic disorders and underdiagnosis of affective disorders among African-Americans observed in the general psychiatric population. In a comprehensive review of misdiagnosis of affective disorders among African-Americans, Adebimpe (1981) reported several possible causes: differences in error between Caucasian and African-American clinicians, social and cultural distance between patient and clinician, stereotypes of African-American psychopathology, biased diagnostic instruments, and the combined effects of various sources of diagnostic error. In a crucial study examining the effects of social distance between patient and clinician, DeHoyos and DeHoyos (1965) surveyed the length of the admission notes in hospital records for Caucasian and African-American patients. The average length of the admission note for Caucasian patients was 18.4 lines versus 12.9 lines for African-American patients. Diagnoses in our study were made by trained and reliable research staff using a standardized diagnostic instrument. However, all of the interviewers were Caucasian.

The increased risk of depression in persons who have been married is consistent with previous findings that depression in schizophrenia is associated with better

<table>
<thead>
<tr>
<th>QOL Domain</th>
<th>Total mean (SD)</th>
<th>Caucasian mean (SD)</th>
<th>African-American mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>4.55 (1.48)</td>
<td>3.94 (1.59)</td>
<td>4.72 (1.39)</td>
</tr>
<tr>
<td>Leisure</td>
<td>4.59 (1.26)</td>
<td>4.16 (1.35)</td>
<td>4.73 (1.21)</td>
</tr>
<tr>
<td>Family</td>
<td>4.60 (1.43)</td>
<td>4.42 (1.55)</td>
<td>4.63 (1.40)</td>
</tr>
<tr>
<td>Finances</td>
<td>3.69 (1.49)</td>
<td>3.37 (1.56)</td>
<td>3.74 (1.45)</td>
</tr>
<tr>
<td>Living situation</td>
<td>4.94 (1.19)</td>
<td>4.71 (1.34)</td>
<td>4.99 (1.12)</td>
</tr>
<tr>
<td>Safety</td>
<td>4.52 (1.37)</td>
<td>4.29 (1.52)</td>
<td>4.56 (1.31)</td>
</tr>
<tr>
<td>Social</td>
<td>4.84 (1.18)</td>
<td>4.50 (1.30)</td>
<td>4.95 (1.14)</td>
</tr>
</tbody>
</table>

Notes.—QOL = quality of life; SD = standard deviation.
prognostic factors. Marriage among persons with schizophrenia is relatively uncommon for males and more prevalent for females and is associated with enhanced social functioning (Eaton 1975; Tsai and Kua 1992; Thara and Srinivasan 1997). Biological and social or psychological explanations are possible. The social or psychological hypothesis suggests that persons who have been married and who have better social functioning are more cognizant of the deterioration in their lives due to schizophrenia symptoms. Consequently, they may be more likely to become depressed. The biological hypothesis suggests that persons who have never been married and who thus have poorer social functioning may have a different form of schizophrenia, for example, the deficit syndrome (Kirkpatrick 1996, 1997). These people may be less likely to become depressed due to biological factors.

The absence of an association between gender and depression and the absence of a gender-marital status interaction warrants discussion. Previous research has shown that, in the general population, women experience higher rates of depression and receive treatment for depression more frequently than men (McGrath et al. 1990; Nolen-Hoeksema et al. 1999). Marriage tends to have a positive effect on depression for men but a detrimental effect for women (Weissman 1987). However, McGrath et al. (1990) also found that positive marriages enhance mental health. In addition, Weissman (1987) reported that in happy marriages, the occurrence of depression was considerably lower. It is possible that the social isolation and life difficulties of persons with schizophrenia, marriage is protective against depression even among women. The impact of the schizophrenic disorder may overpower the complex relationships between gender, marriage, and depression seen in other populations. It is also possible that our sample size was too small to find these effects or that the inpatient sample constructed the types and ranges of patients studied.

The relationship of depression to negative life satisfaction in Caucasians is consistent with previous literature about persons with chronic mental illness. This study sharpens the focus on persons with well-diagnosed schizophrenia. The reductions of over two-thirds of a point on the seven-point QOL scale associated with a diagnosis of depression represents a clinically important change. Although several studies found no significant association between subjective well-being and education in the general population (see Diener’s review, 1984), our finding is consistent with the result reported by Skantze et al. (1992) on outpatients with schizophrenia.

We did not find the expected association between life satisfaction and depression in African-Americans. The absence of this expected association raises a number of important questions that cannot be answered by these data. Are the diagnoses of depression among African-Americans valid in this population? Is the assessment of QOL used in this study valid in this population? The lack of association between depression and QOL among African-Americans, coupled with the reduced odds of receiving a diagnosis of depression among African-Americans, must be considered a call to do more research to understand how unrecognized racial bias influences psychiatric diagnosis and assessment in research and clinical practice.

References


**The Authors**

Lisa Dixon, M.D., M.P.H., is Associate Professor, University of Maryland School of Medicine, Baltimore, Maryland. Lisa Green-Paden, M.D., is Assistant Professor, University of Maryland School of Medicine, Baltimore, Maryland. Theodora Balis, M.D., is Assistant Professor, University of Maryland School of Medicine, Baltimore, Maryland. Ranganathan Ram, M.D., is Assistant Professor, State University of New York at Buffalo, Buffalo, New York. Leticia Postrado, Ph.D, is Assistant Professor and Director of Data...
Analysis, University of Maryland School of Medicine, Center for Mental Health Services Research, Baltimore, Maryland. Janine Delahanty, M.A., is Data Analyst, University of Maryland School of Medicine, Center for Mental Health Services Research, Baltimore, Maryland.