RISK OF PRENATAL DEPRESSION: DIFFERENCES BY RACE

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Background: Approximately 20 million adults suffer from depressive illnesses each year and women are at least twice as likely as men to experience depressive disorders and symptoms. Empirical results have been mixed regarding racial differences in depression prevalence. Given that depression has negative effects on maternal outcomes, little has been explored in regard to prenatal depression across racial/ethnic groups.

Methods: This was a cross-sectional study. Data were abstracted from the 2006 National Inpatient Sample. A total of 877,579 women who delivered in a hospital in 2006 were identified. Presentation of depression at admission was the dependent variable. The independent variable was race/ethnicity that was categorized as White, African American, Hispanic, or other race. Patients' demographics, health insurance status, income level, and hospital characteristics were covariates.

Results: A little more than one percent (1.15%) of the women in the sample had depression as a comorbidity before the delivery. As compared with White women, African American women were much less likely to have the depression presentation (odds ratio (OR) [95% confidence interval (CI)] 0.43 [0.39, 0.47]), as were Hispanic women (OR [CI] 0.27 [0.25, 0.29]) and women of other races (OR [CI] 0.26 [0.23, 0.30]). Moreover, interactive effects between race/ethnicity and insurance status on the depression risk were also observed.

Conclusion: Counterintuitive findings that all minority women had lower depression risk as opposed to that of White women may indicate potential under-diagnosed depression and other mental illnesses among minority women. Further research is needed to examine whether the under-reporting or under-identification exists. (*Ethn Dis.* 2010;20:35–39)

Key Words: Depression, Race, Prenatal, Women

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INTRODUCTION

Depression has become an increasingly important issue in the United States. It is reported that 9.5% of the adults in the United States, or almost 20 million people, suffer from a depressive illness each year.[1] Statistics show that the direct and indirect cost of treatment of depression in the United States reached $43.7 billion dollars in 1990.[2] In addition, research shows that US women are about 1.7 times as likely as men to experience depressive disorders and symptoms,[3] and some other studies report even higher ratios.[4,5] Furthermore, women are also found to have higher rates of depression than men across all cultures.[6]

There have been mixed results regarding racial differences in depression rates, which are probably, in part, due to methodological differences between studies[7]. Riolo, Nguyen, Greden, et al, found that Whites have significantly higher rates of major depressive disorders than African Americans or Mexican Americans.[8] However, Petts and Jolliff found that the rate of depression is higher among young Blacks, Latinos, and Asians than that among young Whites.[9] Some other studies found that no racial difference exists in the prevalence of depression.[10]

Depression in women is important because during pregnancy it can have very serious consequences.[11] Women who suffer from depression prenatally observe dramatic increases in severity of depression during the postpartum period,[12] and are more likely to experience postpartum depression.[14] The prevalence of depressive symptoms rises from 12% before pregnancy to 25% during the third trimester, then drops to 14% during the postpartum period.[13] Among the possible symptoms of postpartum depression are depressed mood, anxiety, compulsive thoughts, difficulty concentrating, poor sleep even when the baby is sleeping, poor appetite, agitation, irritability, loss of control, feelings of inadequacy, inability to cope, irrational fears, fatigue, loss of libido, feelings of guilt and despair. In some cases, the mother may develop suicidal and/or infanticidal thoughts and plans.[15] According to Ugarriza, 8% reported that they were likely to have emotional, behavioral, or cognitive symptoms of postpartum depression.[16] As noted above, depression has different prevalence rates across races; this is also true for postpartum depression. One study showed that reported postpartum depressive symptoms are more common among African American and Hispanic women (44% and 47%, respectively) than White women (31%).[17] Normally, when mothers have low or no levels of depressive symptoms, their children's development, such as smiling and positive interaction, increases with age. When mothers had high levels of depressive symptoms, these age-related increases were absent.[18]

This study examined the risk of prenatal depression among women who had deliveries in a hospital.

Given that racial/ethnic disparities in the risk of depression is not clear and little is known regarding prenatal depression across racial/ethnic groups, this study examined the risk of prenatal depression among women who had deliveries in a hospital.

METHODS

This is a cross-sectional study and the unit of analysis was the individual discharge of hospital delivery. Data were abstracted from the 2006 National Inpatient Sample (NIS). Based on the International Classification of Disease, Clinical Modification, Version 9 (ICD-CM-9) codes for delivery, identified by other studies,[19] a total of 877,579 women who delivered in 686 acute hospitals in 2006 were identified.

Presentation of depression at admission was the dichotomous dependent variable. The independent variables were based on race/ethnicity that was categorized as White, African American, Hispanic, or other race (eg, Asian, Pacific Islander, and Native American). Three dummy variables were created to represent three minority groups whereas the White women group was assigned as the reference group.

Multiple logistic regression was applied to examine the relationship between the independent variables and the dependent variable. A set of covariates were controlled for in the multiple logistic regression analysis. First, patient socio-demographics and socioeconomic variables, including age, insurance status, and income level were controlled because socioeconomic factors affect depression.[20,21,22] To expand to meaningful intervals, age was divided into six groups: 15–19, 20–24, 25–29, 30–34, 35–39, and 40 and older. The aged 25–29 years group was assigned as the reference group and five dummy variables were created to represent the other five age groups. Insurance status was categorized as Medicare, Medicaid, uninsured, privately insured, including HMO/prepaid health plans, or other insurance categories. Four dummy variables were created to represent Medicare, Medicaid, uninsured, and other insurance categories, while private insurance was assigned as the reference group. The income level was measured by quartiles of the median zip code income. Three dummy variables were created to represent the first to the third quartiles, while the fourth quartile (ie, the highest income level) was used as the reference group.

In addition, we controlled for several hospital level variables including: number of hospital beds; whether the hospital was located in a rural area; whether the hospital was a teaching hospital; and the US region (ie, East, Midwest, South, and West) where the hospital was located.

Finally, given the fact that race/ethnicity is highly correlated to health insurance status,[23] the interaction effect of race/ethnicity and health insurance on the presentation of depression was also examined. Specifically, six interaction terms were formed by using the three minority dummy variables (African American, Hispanic, other races) and two insurance status dummy variables (Medicaid and uninsured) and included in the multiple logistic regression.

Table 1. Sociodemographic characteristics of women who delivered in 2006, by race*

	White	African American	Hispanic	Other Races	Total†
Total number of discharges	325,611	76,532	180,724	59,734	877,599
Percentage with depression at admission	1.62%	0.79%	0.48%	0.47%	1.15%
Demographic characteristics					
Age, mean (SD), years	28.1 (6.0)	25.7 (6.2)	26.4 (6.1)	28.8 (6.0)	27.4 (6.1)
Age group					
15–19	7.6%	16.5%	13.8%	6.6%	10.3%
20–24	23.2%	32.0%	29.1%	18.9%	25.4%
25–29	28.5%	24.9%	27.0%	28.0%	27.8%
30–34	24.4%	15.9%	19.1%	28.5%	22.2%
35–39	13.4%	8.4%	8.9%	14.8%	11.6%
≥40	3.0%	2.3%	2.0%	3.2%	2.6%
Health insurance‡					
Private insurance	64.7%	34.6%	24.0%	55.7%	50.3%
Medicaid	30.2%	59.6%	63.5%	36.5%	42.4%
Uninsured	2.2%	3.0%	10.6%	5.6%	4.4%
Zip code income					
1st quartile	19.3%	48.5%	40.8%	22.0%	27.3%
2nd quartile	25.5%	23.0%	25.1%	21.6%	25.6%
3rd quartile	27.2%	17.2%	19.6%	22.0%	24.5%
4th quartile	28.1%	11.3%	14.6%	34.4%	22.6%
ALOS, mean (SD), days	2.6 (2.4)	2.9 (2.9)	2.5 (2.1)	2.7 (2.1)	2.6 (2.4)

* Data are expressed as percentage unless otherwise indicated.
† Including those whose race information was missing.
‡ Results of Medicare and other insurance programs not listed.
SD: standard deviation.
ALOS: average length of hospital stay.

RESULTS

Among all women in the sample who delivered in 2006, 1.15% had depression as a comorbidity at hospital admission. As shown in Table 1, White women had the highest percentage,

Table 2. Depression risk among women who delivered in 2006 (*N*=879,646)

	Odds Ratio	95% CI for Odds Ratio	*P*-value
Race			
White (reference)	1.00	-	-
African American	0.43	0.39–0.47	<.001
Hispanic	0.27	0.25–0.29	<.001
Other races	0.26	0.23–0.30	<.001
Age group			
15–19	0.81	0.75–0.89	<.001
20–24	0.90	0.85–0.96	0.001
25–29 (reference)	1.00	-	-
30–34	1.08	1.01–1.14	0.018
35–39	1.19	1.11–1.28	<.001
≥40	1.30	1.15–1.47	0.001
Health insurance			
Private insurance (reference)	1.00	-	-
Medicaid	1.47	1.39–1.54	<.001
Uninsured	0.79	0.68–0.92	0.002
Zip code income			
1st quartile	0.99	0.93–1.07	0.984
2nd quartile	1.14	1.07–1.22	<.001
3rd quartile	1.17	1.10–1.24	<.001
4th quartile (reference)	1.00	-	-

followed by African Americans, Hispanics, and women of other races Both African Americans and Hispanics, on average, were notably younger than White women and women of other races. While 30.2% of Whites were Medicaid patients, the percentages for African Americans, Hispanics, and other races were 59.6%, 63.5%, and 36.5%, respectively. While only 2.2% of Whites were uninsured, the percentages for African Americans, Hispanics, and other races were 3.0%, 10.6%, and 5.6%, respectively. Similarly, higher percentages of African Americans and Hispanics resided in areas with the first quartile median zip code income.

Table 2 compares risk for having depression across racial/ethnic groups, as well as across covariates. As compared with White women, African American women were much less likely to have the depression presentation (OR [CI], 0.43 [0.39, 0.47]), as were Hispanic women (OR [CI], 0.27 [0.25, 0.29]) and women of other races (OR [CI], 0.26 [0.23, 0.30]). As expected, risk of depression increased as age increased. As compared with patients with private insurance, Medicaid patients had a higher risk of depression (OR[CI], 1.47 [1.39–1.54]) whereas the uninsured patients had a lower risk of depression (OR [CI], 0.79 [0.68, 0.92]). As for the median zip code income level, results were mixed. Women residing in the 1st and 4th quartiles had comparable risks of depression whereas women living in the middle two quartiles had a higher risk of depression than that of women living in the top quartile areas.

Moreover, results of the analysis on the six interaction terms yielded three statistically significant results as shown in Table 3. While non-Medicaid Hispanic women had a lower risk of having depression than their White counterparts (OR [CI], 0.42 [0.36, 0.49]), Medicaid Hispanic women had further lower risk of having depression than their White counterparts (OR [CI], 0.21 [0.18, 0.25]). Similarly, while non-Medicaid women of other races had a lower risk of having depression than their White counterparts (OR [CI], 0.32 [0.25, 0.42]), Medicaid women of other races had an even lower risk of having depression than their White counterparts (OR [CI], 0.20 [0.16, 0.26]). Finally, while insured women of other races had a lower risk of having depression presentation than their White counterparts (OR [CI], 0.32 [0.25, 0.42]), uninsured

Our findings consistently show that minority women have lower risk of presenting depression at hospital admission for deliveries than do their White counterparts.

Table 3. Interactive effects of race and social demographic factors on depression risk (*N*=879,646)*

	Hispanic			Other Races		
	Odds Ratio	95% CI for Odds Ratio	*P*-value	Odds Ratio	95% CI for Odds Ratio	*P*-value
Medicaid			<0.001			0.001
Yes	0.21	0.18–0.25		0.20	0.16–0.26	
No	0.42	0.36–0.49		0.32	0.25–0.42	
Uninsured						0.05
Yes	-	-		0.11	0.04–0.33	
No	-	-		0.32	0.25–0.42	

* Reference is White.

women of other races had an even lower risk of depression presentation than their white counterparts (OR [CI], 0.11 [0.04, 0.33]).

To confirm the above findings, we ran a multiple logistic regression analysis in each of the six age groups, each of the three health insurance groups, and each of the four income levels. The results were consistent and all three minority groups had a lower risk of depression presentation than did the White women (results not shown).

DISCUSSION

Our findings consistently show that minority women have lower risk of presenting depression at hospital admission for deliveries than do their White counterparts. Due to contradictory literature about racial disparities in depression, explanations of our findings are also complicated. If minorities do have lower prevalence of depression than do Whites,[8] the interpretation of our results seems to be straightforward, that is, our findings based on pregnant women reflect the racial/ethnic disparities in depression in the general population. However, even Riolo and colleagues[8] acknowledge that sociocultural factors may affect reporting of depression, which, in turn, affects their calculation of the prevalence. For example, when researchers use the Spanish language version of the Diagnostic Interview Schedule to identify depression, non–English-speaking Hispanics may have understood questions differently, may have manifested depression differently, or may have been less willing to endorse depression.[8]

Our findings suggest a similar speculation; there is potentially more under-reporting or under-identification of depression among minority women than among White women. Our results from the race-insurance interaction on depression indicate the counterintuitive racial disparities (ie, minority women had lower risk of depression than do White women) become greater for women in poverty (ie, covered by Medicaid) or without insurance. Interpretations of the greater counterintuitive racial disparities may be explained as: (1) White women become more susceptible to depression than minority women in worse socioeconomic conditions (ie, in poverty or no insurance coverage); or/and (2) minority women become less susceptible to depression than White women in worse socioeconomic conditions. Since both poverty and being without health insurance coverage are personal life-stressors, the second explanation is unlikely to be the case. We, therefore, would speculate that under-reporting or under-identification of depression among minority women may exist.

Limitations existed in this study. Due to low volumes of some minorities we did not separate Asian, Pacific Islander, Native American, Native Alaskan, and other racial groups from each other. Therefore, we did not differentiate potential variations among these groups. Nevertheless, the strongly consistent results from all racial/ethnic groups analyzed in the study made us believe that we would obtain similar results even if we further divided the other races group into subgroups. In addition, the median zip code income available in the NIS was not a very accurate measure for individual or household income. Our analysis could be strengthened if other important information, such as individual/household income, family structure, employment status, were available.

Future studies are needed in several areas. First, longitudinal studies are needed to examine trends of racial/ethnic disparities in the risk of depression among women. It would be ideal to examine the trends by looking at the same national representative data (eg, NIS or the National Health and Nutrition Examination Survey) over time. Second, more studies are needed to explore whether White women are more susceptible to depression or other mental illness than minority women when in difficult socioeconomic conditions. Third, more studies are needed to explore whether under-reporting or under-identified depression as well as other mental illnesses are more likely to exist among minority women than among White women. If under-reporting or under-identification exists, related factors in respect to sociocultural/socioeconomic, healthcare system, and other aspects need to be identified. Finally, given that racial disparities exist in maternal outcomes,[19,24] more studies need to be done to examine interactions between race and depression on maternal outcomes.

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Design concept of study: Shen
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Data analysis and interpretation: Shen, Lin, Jackson
Manuscript draft: Shen, Lin, Jackson
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Administrative, technical, or material assistance: Shen
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