Healthy Start Screens for Depression among Urban Pregnant, Postpartum and Interconceptional Women

Alfred R. Harrington, MD, MPH, MBA and Claudia C. Greene-Harrington, MD
Omaha, Nebraska

Objective: To examine perinatal depression in north and northeast Omaha, NE.

Methods: The records of a sample of 119 randomly selected clients from Omaha Healthy Start (OHS) were reviewed. Three screening instruments were employed to identify women with depression: they were asked whether they were depressed (DQ); they received the Edinburgh Postpartum Depression Scale (EPDS) and/or the Beck Depression Inventory (BDI).

Results: The number of women with depressive symptoms identified by each technique varied from: DQ (16.8%), EPDS (16%) and BDI (7.6%). The three methods identified three subpopulations of women with different maternal and child health risk profiles reflected by their responses on an OHS-developed Maternal and Child Health Risk Assessment Tool (OHS MCH/RAT).

Conclusion: In combination, these simple techniques identified depressed women with different risk profiles who would have been missed using a single approach exclusively.

Key words: perinatal ■ depression ■ screening

 From the Department of Internal Medicine, Creighton University (Harrington, Greene-Harrington); and Harrington & Associates (Harrington, formerly a consultant for Omaha Healthy Start), Omaha, NE. Send correspondence and reprint requests for *J Natl Med Assoc.* 2007;99:226–231 to: Dr. Alfred Harrington, Harrington & Associates, PO Box 3935, Omaha, NE 68103; phone: (402) 630-4594; e-mail: alfred_harrington@hotmail.com

INTRODUCTION

Longstanding disparities in infant mortality exist among different racial/ethnic groups in Nebraska. The infant mortality rate for African Americans was 17.1 infant deaths/1,000 live births from 1993–1997, while the corresponding infant mortality rate for Caucasian infants was 7.6 infant deaths/1,000 live births.[1] During 1997 and 1998, Nebraska had the highest African-American infant mortality rates in the nation (Figure 1).[1] In fact, the relative risk of an African-American child dying in Nebraska continues to be significantly higher than for African-American infants dying in the United States as a whole.[2-7] Most African-American infant deaths in the state occurred in Douglas County, particularly in north and northeast Omaha.[1] In 2006, African-American infant deaths in Douglas County (rate 9.7 infant deaths/1,000 live births) still occur more than twice as frequently as Caucasian infant deaths (rate 4.1 infant deaths/1,000 live births).[34]

Maternal depression can be a risk factor for infant mortality by adversely affecting maternal health and decreasing the ability of a mother to seek out prenatal care. Maternal depressive symptoms have been associated with increased life stress, decreased social support, poor weight gain and the use of cigarettes, alcohol and cocaine.[9] Statistically, significant amounts of psychosocial risk factors in depressed mothers can lead to low-birthweight infants.[8] In addition to poor maternal health and infant birth outcomes,[10] untreated maternal depression can lead to disturbed mother–infant relationships and impaired infant cognitive development.[11-14]

Some data suggest that northeast Omaha has a higher incidence of depression than other parts of the state. In 1993, as part of a national study (National Depression Evaluation Program), a sample from a primary care practice serving the north and northeast Omaha community was screened for depression using the Zung Self-Rating Depression Scale. The age range for 65% of the sample was 18–45 years. Seventy-one percent of the sample practice was female. The Zung Self-Rating Depression Scale assessed that 21.9% of the practice had minimal-to-mild depression. This was comparable to the state sample (22.3%) and the national sample (22.6%). Twenty percent of the north and northeast Omaha practice sample had moderate-to-severe depression. This was significantly higher than the state (11.2%) and national samples (10.8%). The practice sample also had a higher percentage of patients with severe-to-extreme depression (4.8%) compared to the state (3.0%) and national samples (3.3%).[15]

Omaha Healthy Start is a nonprofit organization whose mission is to reduce the level of infant mortality in north and northeast Omaha. Its methods of doing so are: 1) community education and training of focused

maternal, child and family health-related issues; 2) specific maternal and child-related case management via focused data analysis and; 3) evaluation to provide relevant information for program development. Any woman of childbearing age in north and northeast Omaha may seek services at Omaha Healthy Start. However, the majority of clients Healthy Start receives are through its walk-in pregnancy testing service or through referrals it receives from other maternal and child health agencies such as the Visiting Nurse Association (VNA) or Women, Infants and Children (WIC) program. These agencies refer to Healthy Start for an array of case management and family services.

Given the potential effects of depression on maternal health and birth outcomes and the suggestion that the north and northeast Omaha communities may have a higher prevalence of depression, Omaha Healthy Start felt it prudent to examine depression among the clients in its catchment area. This would be consistent with Healthy Start's national initiative on screening for depression.[35] However, screening for perinatal depression is not universal, and we chose to compare three methods to examine which method or combination of methods would be best to identify the most probable cases of perinatal depression.

Patients and Methods

Patients were Omaha Healthy Start enrollees from the north and northeast Omaha catchment area. Clients could be enrolled if they were pregnant or if they had a child aged <2 years old. Once enrolled, a multivariable risk assessment for infant mortality called the Maternal and Child Health Risk Assessment Tool (MCH/RAT) was performed. This medical/social risk assessment tool helped to focus the case manager's development of each client's individual care plan. The sample consists of 119 cases that were randomly selected from the universe of enrolled clients July 2004 to August 2005. By randomly selected, we mean every fifth client enrolled per month to a total of 10 clients per month over a 12-month period were selected. Any given client might enroll in the Healthy Start Program during pregnancy, during the postpartum period or during an interconceptional period if they are seeking to take better care of their children.

Depression in the sample was screened for in three distinct ways. First, all clients who were enrolled in the Healthy Start program were evaluated using MCH/RAT. This tool was developed by Omaha Healthy Start.[16,18] One of the questions on the MCH/RAT—the depression question—asks clients whether they are depressed. Another question asks clients whether they have a history of depression.

Pregnant or postpartum clients were independently tested using the Edinburgh Postnatal Depression Scale (EPDS).[19] The EPDS is a 10-question survey that has been extensively used and validated across different cultures as a depression screening tool.[20-23] Scores of ≥8.5 have identified patients with a risk of depression.[23-25] In this study, an EPDS score of ≥11 was employed to identify potential candidates with depression. A study by Lawrie et al, employing a threshold of 11–12 on the EPDS, identified 100% of women with major depression and 70.6% of women with minor depression.[38] The work of Ascaso Terren et al indicates that a threshold of 11–12 on the EPDS is useful to estimate the prevalence of depression in epidemiological studies.[39]

The third method of identifying depression was the Beck Depression Inventory (BDI). The BDI is a more

Table 1. Comparison of three subgroups of Omaha Healthy Start clients with depressive symptoms

Parameter	EPDS Group	BDI Group	Depression Question Group
Number of Cases	19	9	20
Mean Age	19.7	19.1	19.6
Standard Deviation	4.3	2.1	3.4
95% Confidence Intervals	17.7–21.8	17.5–20.7	18.0–21.2
Distribution of Race/Ethnicity (%)			
African American	84	67	85
NA	5.3	11	5
HA			5
White	10.5	22	5
Distribution of Educational Level (%)			
< High school	68.4	55.6	61.1
High school	15.8	33.3	22.2
> High school	15.8	11.1	16.7
Distribution of Pregnancy Stat (%)			
Interconceptional	5.3	33.3	20
Pregnant	84.2	66.7	80
Postpartum	10.5	0	0
Prevalence of Group in the Sample	0.160	0.076	0.168

* Marital status: all cases identified were of single women

extensive 21-question survey that has also been widely employed and validated for identifying depression.[25,26] The advantage of the BDI is that it identifies the presence of depressive symptoms and also assesses the severity of depression. A BDI score of 11–16 indicates a mild mood disturbance. A score of 17–20 indicates borderline clinical depression. A BDI score of 21–30 indicates moderate depression, 31–40 suggests severe depression and a score of >40 indicates extreme depression. The BDI was initially performed only on interconceptional women; however, its application was changed to include all enrollees.

A positive assessment by any of the screening tests would identify a client as having depressive symptoms.

RESULTS

Demographics

Seventy-three percent of the women in the sample were pregnant, 15% were postpartum and 12% were women between pregnancies who were seeking newborn services.

Ninety-six percent of the sample was composed of single women, 3% were married and 1% of the women were separated from their spouses.

Fifty-nine percent of the sample did not complete high school at the time of enrollment. Six percent of the sample completed their GED. Twenty-four percent of the sample had completed high school at the time of enrollment and 11–12% had completed education that exceeded high-school training.

The mean age of the sample (19.9 years) contrasted with the mean age of mothers giving birth in Douglas County in 2004 (27.5 years).[37] The range of ages in the sample was from 13–36 years. The age range of women giving birth in Douglas County during 2004 was 13–46 years.[37] Twenty-two percent of the sample was composed of teenagers (viz. clients ≤17 years old). The percentage of teens in the sample varied from 22–55% depending on whether the selection is of teens ≤17, ≤18 or <20 years. Forty-four percent of all teen pregnancies (clients ≤17 years) occurring in Douglas County in 2004 occurred in northeast Omaha. Overall, teen pregnancy in Douglas County has been on the decline. This has been true among teens in general and black teens in particular.[17]

The sample is largely African American. However, 10% of the clients being served are white. Sudanese, Hispanic Americans and Native Americans have also been served. A comparison of the race/ethnicity of the sample and of northeast Omaha is provided (Figure 2).

Three Depression Subgroups

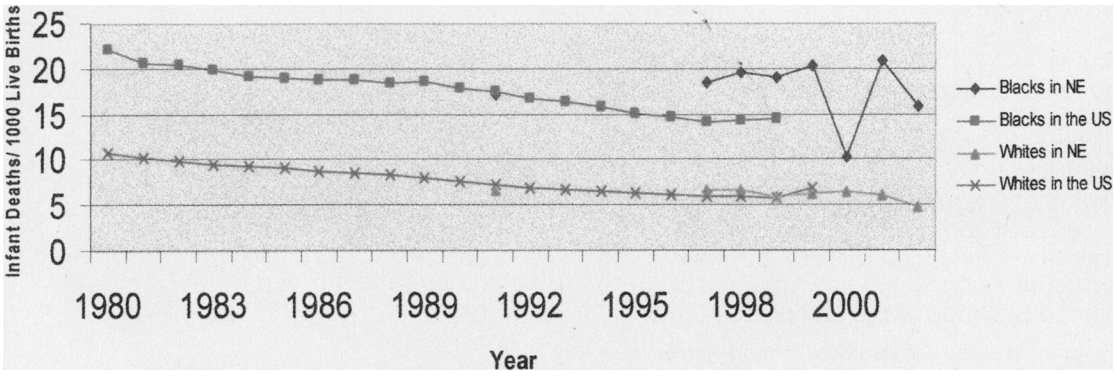
The results of the study identified three overlapping but distinct subpopulations of clients who had depressive symptoms. The first group had an EPDS score of ≥11. The second group had a BDI score of ≥11. The final group responded affirmatively when they were asked whether they were depressed [the depression question (DQ) group].

The three subpopulations were compared in a number of ways: 1) by EPDS and BDI scores; 2) demographically (Table 1) and; 3) via their collective response to questions from the MCH/ RAT.[18]

Prevalence and Depression Score Comparison

Between 12–25% of women have depressive symptoms during pregnancy, and the incidence is even higher among adolescents and poor minority women.[27,28] The collective EPDS scores for each of the subgroups were one way of comparing the three subpopulations. The EPDS group identified 19 enrollees with an EPDS score of ≥11. This group had a mean EPDS score of 14.95 with 95% confidence intervals (CIs) of 13.21–16.68. The mean BDI score for the EPDS group was 18.8 with 95% CIs of 6.85–30.75. This suggests that, on average, the EPDS group had borderline clinical depression,

Figure 1. Comparison of infant mortality between blacks and white in the United States and Nebraska, 1980–2003



although the variation was considerable. If only the EPDS screen was employed, the prevalence of depression would be 15.97% (19/119) in the sample.

The BDI group constituted a total of nine enrollees with BDI scores of ≥11. This means that this group had to have at least mild mood disturbances to be identified. Of the BDI group, five clients also received an EPDS evaluation. The BDI group had a mean EPDS score of 17.2 with a 95% CI 12.28–22.11. This means that, on average, if this group received an EPDS screen, it would also recognize them as being depressed. This group also had a mean BDI score of 20 with 95% CI of 13.81–26.18. On average, the clients identified in the BDI group had at least borderline clinical depression; however, exclusive use of the BDI screen only identifies 7.56% (9/119) of the women in the sample as being depressed.

The DQ group constituted a total of 20 clients. There was some overlap of individuals between groups. A total of nine clients in the DQ group also received an EPDS evaluation. The mean EPDS score for this group was 13.1 with a 95% CI of 7.82–18.40. The mean BDI score was 21.4 for this group. The 95% CI was 7.78–35.02. This means that the average client in the DQ group had moderate depression. Employing the DQ screen exclusively identified 16.8% (20/119) of the mothers in the sample as being depressed.

In total, 36 women were identified as having depressive symptoms using these screening techniques. This makes the prevalence of depressed mothers in the sample 30.2% (36/119), which is more consistent with an inner-city population of urban women.[29]

Statistical Difference in the Screening Scores

The mean scores for the EPDS and BDI questionnaires in each subgroup were well over the minimum threshold scores for depression in all of the subgroups. However, the variance for the BDI score was generally greater than for the EPDS score.

The EPDS scores were compared between the EPDS and BDI subgroups as well as between the EPDS and DQ subgroups using the rank sum test and found to be statistically different at the 0.05 significance level. The EPDS scores for the BDI and DQ groups were also found to be statistically different at the 0.05 significance level using the rank sum test.

BDI scores were also compared employing the rank sum test. The BDI and the DQ groups as well as the EPDS and the BDI groups were found to have BDI scores that were statistically different at the 0.05 significance level. However, the difference in BDI scores for the EPDS and the DQ group were not statistically significant.

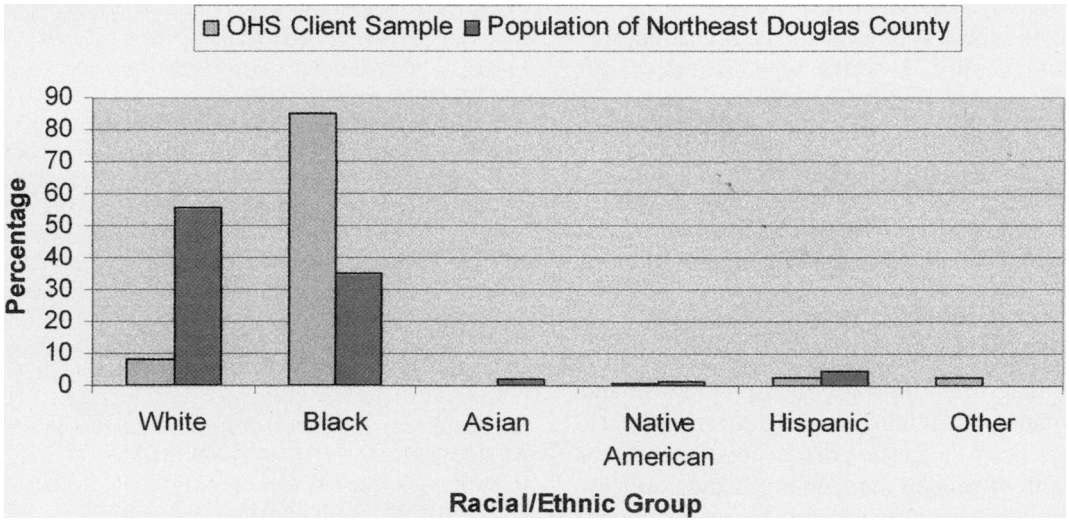
Demographic Comparison

The mean ages of the subgroups were equivalent. All subgroups were composed predominately of clients with an education of less than high school. The EPDS subgroup clearly had the most clients who did not complete high school. The BDI group had the greatest percent of its members completing high school and the DQ group had the greatest percentage of its members going beyond a high-school education.

The EPDS subgroup had the greatest percentage of pregnant women and was the only subgroup that included postpartum women. The BDI group had the greatest percentage of interconceptional women. All of these subgroups were exclusively populated by single women, suggesting an absence of one kind of social support and the presence of a risk factor for depression.[31]

There are women in the Omaha Healthy Start catch-

Figure 2. Percent distribution of racial/ethic groups in Omaha Healthy Start sample and in northeast Douglas County



ment area with depressive symptoms. By identifying this population with the EPDS, BDI and DQ, we were able to learn that:

1. Three distinct but overlapping subsets of women with depressive symptoms can be identified depending on the method employed.
2. The EPDS subgroup can be characterized as needing Medicaid, having a child <1 year of age at home, not breastfeeding, having depression and a history of depression, not perceiving a great deal of stress in their lives during pregnancy and having adequate social support. The EPDS test is more likely to identify persons with anhedonic and anxiety symptoms rather than those with vegetative symptoms.[32]
3. The BDI subgroup can be characterized as needing Medicaid, having women with numerous financial concerns but not needing financial assistance, having a child <1 year of age at home, breastfeeding, having prenatal care but having no dental care in six months, being depressed, having a history of depression, smoking, having inadequate social support, and having a variety of social/family issues in their lives.
4. The DQ group can be characterized as recognizing that they had mental health issues, having financial issues and needing financial support, being less likely to have a child <1 year of age at home, not breastfeeding, not having dental care in <6 months, being depressed and having a history of depression, having mental illness other than depression, being smokers, perceiving a great amount of stress in their lives and not having adequate social supports.
5. The percentage of women with depressive symptoms varied with each screening test employed. However, the estimates were within estimates described elsewhere.[29]
6. By employing these approaches in combination, we were able to identify 36 women with depressive symptoms, some of whom might have otherwise been missed using a single test exclusively.

MCH/RAT Comparison

The distribution of risk factors in the MCH/RAT could serve as predictors of depression in each of these subgroups.

CONCLUSIONS

We know that infant mortality is high in north and northeast Omaha, particularly among African Americans.[1] There is also a suggestion that depression is a factor in the health of women living in north and northeast Omaha.[15] We also know that depression can negatively impact maternal and child health and development.[27] In screening for depression, three approaches were employed: 1) MCH/RAT, 2) EPDS, and 3) BDI.

It was felt that using these tools in concert would provide a more comprehensive picture of depression in northeast Omaha.[15] We asked the following questions: How did the women who met the various criteria for being considered depressed compare? If we employed just one technique, would we also be finding the women who would be detected using the other approaches? This preliminary study suggests that the women identified using each screening tool have somewhat different risk profiles. The study also suggests that if more than one tool was employed, then additional women with depressive symptoms would be identified who might otherwise be missed using one screening tool.

Just as these mothers and their pregnancies are subject to socioenvironmental factors that induce depression, modification of these socioenvironmental factors (i.e., social support) can mitigate against depression.[33] By being able to identify women early and intervene early, we might be able to reduce the effects of these socioenvironmental factors on perinatal depression and maternal and child health in north and northeast Omaha. This study suggests further work is needed in this area.

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