DEPRESSIVE SYMPTOMS AND ASSOCIATED RISK

FACTORS AMONG PREGNANT FEMALES OF LOW

SOCIOECONOMIC BACKGROUND

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Abstract

Objective: The purpose of the study is to describe factors associated with depression during pregnancy among females of low socioeconomic background. **Background**: Depression during pregnancy may lead to (1) depression following delivery (2) increased likelihood of low birth weight babies and preterm deliveries and (3) longer-term effects on maternal-infant interaction. Younger women and women of African-American race are at greater risk (National Center for Health Statistics 2002). Risk factors associated with depression during pregnancy are high psychosocial stress levels, less education, preexisting medical conditions and low socioeconomic status. We describe the incidence of depressive symptomology and associated risk factors among pregnant females of low socioeconomic background. A descriptive, exploratory design was employed with data collected from participants in the MOMS2B project. The parent study uses concepts from the social determinants of health model. Pregnant women from a neighborhood in which single, predominantly African-American and low-income women reside, were recruited to participate in MOMS2B, a nutrition education and social support program, and respond to questionnaires regarding health behaviors. **Methodology**: Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D) a 20-item instrument that is used to assess depression in general population. The CES-D was administered at weeks 2, 5, and 10 in the 10 week program. **Sample**: 26 women have completed CES-D, (N=26 at week 2, N=20 at week 5, and N=12 at week 10). Fewer women were available for week 10 assessments as they delivered prior to completion of all sessions. **Results**: The mean CES-D score for entire sample was 18.7 (SD = 10.4) with a range from 3 to 49. There was no difference in scores obtained between measurement time points (F=1.34, NS). Stressful events and low

food security were significantly associated. The other factors predicted to be associated with depressive symptomology such as younger age, fewer years of formal education and number of children did not reach significance. **Conclusion**: The findings reinforce the importance of screening for depression and intervening to improve maternal mood and functioning.

Key Words: Depression, pregnancy, low socioeconomic background, CES-D scale

Introduction

Pregnancy is a period of joy and brings feeling of pride for certain women, but for certain females, it can be accompanied by stress, fear, feeling of worthlessness, depression and ultimately Death. According to the Massachusetts General Hospital center of women's mental health, "recent studies suggest that up to 20% of women suffer from mood or anxiety disorders during pregnancy". Depression in pregnancy can affect both the emotional and psychological well –being of the pregnant women. The antepartum period is the period where women needs to take care of herself and her developing baby, but instead, the depressive thoughts encircle around her and cause feeling of hopelessness and remorse.   One of the most obvious concerns related to depression during pregnancy is the potential worsening of the condition. Untreated depression may lead to suicidal ideation and attempts. "Although completed suicides are rare among pregnant women, according to available reports, rates of suicidal ideation range from 3% to 18%" (Bonari, Pinto &Ahn, 2004). Untreated depression can bring potential risks for the mother and the baby. "Depressive behavior of the mother is associated with adverse birth outcomes and adverse pregnancy such as low birth weight (LBW) babies and preterm deliveries. The rate of LBW infants in the United States increased from 7.6% to 8.2% from 2000-2005.   There is an increase in 22% since 1984" (Martin, Hamilton &Sutton, 2002). "Compared with White and Latino women, African American women are reportedly at highest risk for delivering low birth weight infant and delivering prematurely" (Hamilton, Martin &Ventura 2008). Black women reported more symptoms of depression than any other ethnic group in an even larger database of 5,200 cases from the National Maternal and Infant Health Survey of the National Center for Health Statistics (Branch, 2002). Pregnant women who are able to get greater degrees of support, or who have a greater concept of self-esteem, have also been able to achieve greater participation in prenatal care programs (St. John & Winston, 1989; Higgins *et*

al., 1994). Women with greater support and better self-esteem experience fewer perinatal complications, including a reduced incidence of preterm labor and LBW (Oakley, 1985; Klaus *et al.*, 1986). Women who exhibit greater degrees of personal behavioral and psychosocial control also experience improved pregnancy outcomes on several maternal and infant measures (Brooke *et al.*, 1989; Homer *et al.*, 1990).

Antenatal depression has been implicated as one of several risk factors for postpartum depression (Hobfoll, Ritter, Lavin, Hulsizer, & Cameron, 1995; Da Costa, Larouch, Dritsa, & Brender, 2000), and a recent review reports several studies finding associations between untreated antenatal depression and such pregnancy outcomes as preterm delivery, fetal growth retardation, pre-eclampsia, and miscarriage (Bonari, Pinto, Ahn, Einarson, Steiner, & Koren, 2004). Moreover, Major Depressive Disorder may also interfere with breast feeding because depressed women lack energy and miss infant feeding ques (Bogen, Hanusa, Kolko, &Wisner, 2010).

Gotlib et al. (1989) reported that depressed pregnant women had a significantly younger age, lower education, and higher number of children than their non-depressed counterparts. A more recent study of similar sample size (Leigh & Milgrom, 2008) concluded that poor social support, negative cognitive style, major life events, and low income were significant predictors of depression in women in the second trimester of pregnancy. A review article examined 57 studies that included information on the association between antenatal depressive symptoms and risk factors (Lancaster *et al*., 2010). The authors summarized that some of the most important risk factors, indicated by the literature, are life stress, history of depression, lack of social support, unintended pregnancy, Medicaid insurance, domestic violence, lower income, lower education, smoking, and single status.

The purpose of this study is to describe factors associated with depression during pregnancy among females of low socioeconomic background. Many of these risk factors and depression have

been explored in pregnant women participating in a prenatal nutrition and social support program known as MOMS2B, a community group for pregnant women in a low income neighborhood of a metropolitan area in Ohio. Weekly, women experience nutrition education and prepare a meal to share together with all participants. These weekly meetings allow for monitoring of vital indicators throughout pregnancy, such as weight gain, health behaviors, blood pressure, and mood, with the ultimate goal to decrease infant mortality in that high-risk neighborhood.

The MOMS2B program uses concepts from social determinants of health model. Social determinants of health are the economic and social conditions, and their distribution among the population, that influence individual and group differences in health status. They are risk factors found in one's living and working conditions (such as the distribution of income, wealth, influence, and power), rather than individual factors (such as behavioral risk factors or genetics) that influence the risk for a disease, injury, or vulnerability to disease or injury (Raphael, 2009).

Review of Literature

The various factors contributing towards depression in pregnancy are:

Age: Despite reductions in the rate of adolescent pregnancy and birthrates during the 1990s, adolescent pregnancy rates in the United States still exceed those of other developed countries by 2- to 15-fold (Kirby, 2001). Four of 10 adolescent girls get pregnant before the age of 20 in the United States, leading to ~900 000 teenage pregnancies each year (Miller, 2000). Women of childbearing age have a 10-25% lifetime risk of developing a depressive disorder, with peak prevalence occurring in the age range of 25-44 years (Burke, Burke, Rae & Regier, 1991).

Race: There are disparities in the incidence of depression in pregnancy. Of the five percent of the women who reported antenatal depression, Blacks and Asian/Pacific Islanders were more likely to be depressed than non-Hispanic whites, even after controlling for confounders (Gavin, Melville, Rue, Guo, Dina & Katon, 2010). Black women reported more symptoms of depression than any other ethnic group as evidenced by an analysis of 5,200 cases from the National Maternal and Infant Health Survey of the National Center for Health Statistics (Branch, 2002).

Poverty: Some epidemiological studies also suggest that individuals living in poverty, compared with those in the general population, are at increased risk of major depression and that women who are poor, compared with women in general, have higher rates of depressive symptoms (Kessler, Bergland & Demler, 2003). The impact of living with a low income may limit access to health care, thus potentially delays preterm and preventative care of the mother and the baby, and limit access to mental health care. Access to fresh fruits and vegetables is also limited in low socioeconomic areas, a factor that may negatively impact a family's nutritional status, as well as other health behaviors that reduce depressive moods.

Fewer Years of formal education: A lack of formal education results in less knowledge about pregnancy and appropriate prenatal healthcare as a whole. The antenatal visits comprise of health education delivered to the pregnant females that focuses on provision of iron and folic acid supplements, care of newborn, breastfeeding, nutrition of child and family planning. Antenatal visits can prove to be a platform for advising women on the physical, physiological and psychological changes during pregnancy; nutrition and immunization of the newborn and mothers; proper birth

spacing; and prevention of malnutrition. Postpartum depression is also one of the major morbidity affecting maternal health, which could be, addressed in the prenatal period.

Smoking: The co-occurrence of high prevalence rates of both smoking and depressive symptoms has stimulated researchers to investigate the associations between the two, and an association has been reported in pregnant women (Zhu & Valbo, 2002). Smoking during pregnancy increases risks for outcomes ranging from preterm birth to sudden infant death syndrome. Reducing or quitting smoking during pregnancy decreases these risks. In cross-sectional studies, depressive symptoms have been associated with continued smoking during pregnancy, as well as with lower rates of smoking cessation in the general population. The nature of the association between smoking and depressive symptoms has been discussed in terms of a bidirectional relationship, where depressive symptoms are a risk factor for smoking and smoking is a risk factor for depressive symptoms (Windle &Windle, 2001). However, contradictory findings have emerged from studies that have attempted to establish causal relationships between the two (Brook, Schuster, & Zhang, 2004).

Low food Security: Proper nutrition during pregnancy is vital to promoting optimal fetal development during pregnancy. Lower intakes of green leafy vegetables and fruits (Mikkelsen *et al.* 2006) as well as caloric and protein restriction (Kramer & Kakuma, 2003) have been associated with suboptimal birth weights. Among pregnant women, food insecurity has been associated with an increased risk of certain birth defects, including spina bifida and anencephaly (Carmichael *et al.* 2007), and has been shown to increase the likelihood of delivering a low birth weight infant (Borders

et al. 2007). Thus, it is important to understand the food security in dimensions of the psychosocial aspect of a female.

Chronic stress: Belle (1990) notes that women who are poor also more frequently experience threatening and uncontrollable life events, exposure to multiple forms of interpersonal and community violence (that is, emotional, physical, and sexual violence and witnessing violence), and chronic stressors. women who able to get greater degrees of support, or who have a greater concept of self-esteem, have also been able to achieve greater participation in prenatal care programs (St John & Winston, 1989; Higgins *et al.*, 1994). Women with greater support and better self-esteem experience fewer perinatal complications, including a reduced incidence of preterm labor and LBW (Oakley, 1985; Klaus *et al.*, 1986). Women who exhibit greater degrees of personal behavioral and psychosocial control also experience improved pregnancy outcomes on several maternal and infant measures (Brooke *et al.*, 1989; Homer *et al.*, 1990).

Methodology

The research used descriptive exploratory design for the secondary analysis from the data collected for participants in the MOMS2B project. This design is particularly appropriate for areas such as this where nurses have little theoretical or factual knowledge (Carter & Porter, 2000). The data collected are often quantitative, and statistical techniques are usually used to summarize the information. Descriptive research goes further than exploratory research in examining a problem since, it is undertaken to ascertain and describe the characteristics of the issue. This is conducted when there are few or no earlier studies to which references can be made for information. The aim is to look for patterns, ideas or hypotheses rather than testing or

confirming a hypothesis. In exploratory research the focus is on gaining insights and familiarity with the subject area for more rigorous investigation later. Variables included in the study were age, race, income, education, smoking status, depression, prenatal stress, and food security.

Demographic variables. Demographic variables, including age, race, income, education and smoking status were reported by MOMS2B participants on a demographic form. Data were reported as scale or categorical values, and de-identified for use in this analysis.

Depression: Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D), a 20-item instrument originally developed for the measurement of depressive symptomatology in the general population. The CES-D has been widely used in clinical and population-based studies of depressive symptoms, including studies of pregnancy and race (Orr, James, and Blackmore-Prince, 2002). Validation and reliability studies have demonstrated that this instrument is a suitable screening tool for use across population subgroups of age, sex, race, and socioeconomic status (Williams, Taylor, Makambi, Harrell, Palmer, Rosenberg, & Adams-Campbell, 2007). Items were scored on the four-point response scale (0 to 3) and included such constructs as hopelessness, restless sleep, loneliness, fear, sadness, and changes in appetite. CES-D scores have a potential range of 0 to 60, with scores of 16 or above generally considered indicative of depressive symptoms. As a screening test, the CED-D score is categorized in the following three categories: Less than 15 do not experience High levels of Depression; 15-21, Mild to Moderate Depression; Over 21, Possibility of Major Depression. The CES-D was administered to the respondents at weeks 2, 5, and 10 in the prenatal period in the 10 week program.

The CES-D has been shown to be a reliable measure for assessing the number, types, and duration of depressive symptoms across racial, gender, and age categories (Radloff, 1977). Concurrent validity by clinical and self-report criteria, as well as substantial evidence of construct validity has been demonstrated (Radloff, 1977).

Prenatal Stress: Participants completed the Prenatal Hassle Scale, an 18-item questionnaire that assessed the degree to which common hassles (such as money worries, worries about transportation etc.) were perceived as stressful (on a 4-point scale ranging from *no stress* to *severe stress* during the past 12 months. The Prenatal Hassles Scale is a brief scale with good psychometric properties developed to assess stressors specific to pregnancy in middle to lower SES women from diverse ethnic and cultural backgrounds. The scale was adapted from the Prenatal Psychosocial Profile Hassles Scale, which referred to stress during pregnancy (Misra, O'Campo, & Strobino, 2001), which in turn was adapted from the stress subscale of the Prenatal Psychosocial Profile developed by Curry Campbell, and Christian (1994). The Prenatal Hassle Scale was administered in the second session.

Food Security: Food security was assessed by administration of a 6-item short form food and security questionnaire developed by the National Center for Health Statistics. The advantages of the short form food security questionnaire are that it serves as a less respondent burden for food-insecure households. It can be screened after three items to reduce burden for households with no food access problems. Prevalence estimates of food insecurity and very low food security are only minimally biased relative to those based on 18-item or 10-item modules.

In addition, it is a standard short form with known relationship to full module. The food security short form (6 items) was administered in the second session.

Results

Data for the study were selected from the MOMS2B database and organized as de-identified data in a database file. Data were analyzed using descriptive and correlation statistics by means of the statistical program Statistical Program for the Social Sciences (SPSS) version 19.

Description of Sample

The sample consisted of 26 women who attended the MOMS2B as of 08/31/2011. The mean age of the participants was 23 ± 5.4 years. Fifty-two percent of the women completed high school or obtained a GED. Two 8% of the women were Caucasian, and 92% of the women were African-American. The average number of children prior to enrollment was 2 ± 2.3, while the range was 0 children to 11 children.

Assessment of Depression

The number of participants who completed the CES-D was different for the three data collection points, with 26 women responding at week 2, 20 women responding at week 5 and 12 women responding at week 10. At the week 2 assessment, 20 women (77%) reported depressive symptomology, as indicated by a CES-D total score of ≥ 16. The mean score on the CES-D at each time point was calculated. At week 2, 26 women had a mean score of 22.2, at week 5; 20 women had a mean score of 20.7, and at week 10, 12 women had a mean score of 10.8.

The Prenatal Hassles Scale score can range from 18 to 72. In this sample, the range was 22 to 45, with a mean score of 31.2±7.3 (S.D.).   Items on the scale for which the mean score was highest are shown in rank order in the following table:

Table 1

High Average score on the items from the Prenatal Hassles Scale

Item from the Prenatal Hassles Scale	Mean ±SD
Worries about money	2.64 ± 1.1
Worries about transportation	2.48 ± 1.3
Pregnancy itself	2.28 ± 1.1
Generally overloaded	2.28 ± 0.8
Having to move recently or in future	2.24 ± 1.1

The food security scale has a possible score of 0 (high food security) to 6 (very low food security). Sixty percent of women in this sample have some level of food insecurity. Of those women, 28% indicated very low food security, while 32% reported low food security. The remaining 40% of women indicated they were highly food secure.

We hypothesized that age, number of years of education, number of children, higher levels of stress, and low food security would be associated with depression. In fact, only stressful events and low food security were significantly associated with depression.

Table 2

Correlation between Depressive symptoms, Low Food Security and Prenatal Hassles scale

	Low Food Security	Prenatal Hassles Scale
Depressive Symptoms	r=0.432 p=0.03	r=0.813 p=0.000
Low Food Security		r=0.525 p = 0.007

Note: Findings significant at p < 0.05.

The other factors predicted to be associated with depressive symptomology such as younger age,

fewer years of formal education, and number of children, did not reach significance.

Table 3

Correlation between CES-D score at weeks 2, 5, and 10 with the age, highest grade

completed and number of children were not significant

	Age in years	Highest Grade completed	Number of children
Week 2 CES-D	r=0.234 p=0.261	r=-0.090 p=0.683	r=0.135 p=0.520
Week 5 CES-D	r =0.063 p=0.793	r=-0.028 p=0.912	r=0.031 p=0.898
Week 10 CES-D	r=0.007 p=-0.983	r=0.233 p=0.491	r=-0.102 p=0.753

Discussion and Conclusion

In this study, we hypothesized that risk factors identified as social determinants of health,

including age, race, socioeconomic status, years of education, number of children, prenatal

hassles, and low food security, would be associated with depressive symptoms in women from

the MOMS2B program. We were not able to assess for certain relationships, such as race,

socioeconomic status, and education due to the homogeneity of the group, however, we did

describe variables such as age, education, number of children, prenatal hassles and food security.

Further, we assessed the association of these variables with depression. Low food security and

prenatal hassles were associated with depression in this sample, while other hypothesized

variables were not. The statistical analyses conducted on these data fluctuate over the three

measurement points due to the decreasing number of participants who provided data from the

first assessment to the third. Thus, these data must be interpreted with caution.

It is clear that the women participating in the MOMS2B program have complex and stressful

lives. The social and nutritional support is needed to encourage a sense of community and

empowerment, as well as to address low food security.

Recognition of the factors associated with depressive symptoms will help to direct

nursing interventions to improve maternal mood, reduce adverse outcomes, and improve

interactions between mother and child. Improving food security and reducing stresses or

improving coping should be targets for such interventions. The overall attempt would be to help

women regain their functioning and prevent worsening of depression following delivery. The

social support programs such as MOMS2B involve collaborative efforts of the multidisciplinary

team members including the nurses, who cannot only assess the clinical depression, but also

provide help and resources to the future mothers to effectively handle their pregnancy without

struggling with the depression.

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