FINAL COMPREHENSIVE REPORT
THE MATERNAL AND CHILD HEALTH RESEARCH PROGRAM
Preventing Postpartum Depression in High-Risk Pregnant Latinas:
Effects on Maternal and Infant Health

I. Introduction
    A. Nature of the research problem

Postpartum depression (PPD) is the most common psychiatric illness that occurs in women of childbearing age, with 10 to 15% of new mothers developing clinically significant symptoms. Low-income and ethnic minority women may be at particular risk. PPD can have lasting negative consequences for the women, early infant attachment, and later parent-child relationships. Known risk factors for PPD include a prior history of psychopathology, poor social support, poor marital quality, and increased stressful life events. The fact that most women with PPD never get treatment highlights the need to develop effective interventions to prevent the development of PPD in high-risk groups.

    B. Purpose, scope, and methods of the investigation

The purpose of this project was to contribute to the growing evidence-base that cognitive-behavioral interventions can be effective in preventing major depression. Our research focused on an understudied group of low-income Latinas at high-risk for developing PPD. Using a participatory research paradigm, we identified two community-based programs serving a large population of Latino families in the Washington DC area and embedded a preventive intervention into primary care settings. The Mothers and Babies (MB) course is a cognitive-behavioral intervention aimed at teaching women mood regulation skills to prevent the onset of major depressive episodes and at improving mother-infant relationships. The original 12-week intervention was shown to be effective in a sample of predominantly Mexican women in the San Francisco, CA area (Muñoz et al., 2007) and in this study was tested in the Washington, DC area and among the New Latinas, who are of predominantly Central American backgrounds.

This study had two primary aims:

1. To revise the Mothers and Babies course by: shortening it from 12 to 8 weekly sessions and integrating culturally relevant content informed by the migration experiences of the New Latino groups in the Washington DC area.

2. To assess the effectiveness of the revised MB course using a randomized controlled trial design in 217 participants who met demographic and depression risk criteria.

The longitudinal study combined qualitative data collection with the administration of psychometrically rigorous questionnaires at five time points (2 during pregnancy and 3 in the first year postpartum). A broad array of domains was studied including maternal depression, psychosocial risk and protective factors, and maternal and infant health outcomes.

    C. Nature of the findings

To evaluate the effectiveness of the intervention, the study's main findings rely on data from self-report questionnaires administered to all participants at five times during pregnancy and the first year postpartum. Data were compared for participants in the two groups (intervention/MB vs. Usual Care/UC) to examine whether the intervention was effective in reducing depressive symptoms and the onset of major depressive episodes and improving maternal and infant health during the first year postpartum. Detailed findings are reported in section IV.D below. In summary, there was a significant short term effect in depressive symptoms between groups, in which intervention participants had significantly lower depression

scores than UC participants. In addition, there were fewer new cases of depression in the intervention group (n=0) compared to UC (n=3; 3.6%), but this difference was not statistically significant. There were no significant long-term effects of the intervention in any of the main study measures. However, the exit interviews suggested that <u>both</u> groups benefited from participating in the study but in different ways. The MB participants appreciated the group support of the class during pregnancy and requested that the class continue to the postpartum period. In contrast, the UC participants acknowledged the significant contribution of the ongoing support of the research team in their lives throughout the perinatal period. Additionally, as a result of completing the study questionnaires multiple times, they became more aware of their mood and their interactions with their infants. These latter results suggest that the UC condition was in fact not "usual care," but rather constituted an active intervention.

II. Review of the Literature

        Women in the childbearing years are at highest risk of developing depression in the perinatal (i.e., pregnancy to first year postpartum) period (Gaynes et al., 2005). The strongest risk factors for PPD are past history of psychopathology, marital difficulties, lack of social support, and negative life events (Beck, 2001; O'Hara & Swain, 1996). These risk factors are markers that can be identified through screening. However, perinatal depression is often underrecognized and undertreated (Kelly, Zatzick & Anders, 2001; U.S. DHHS, 2000). All of these reasons underscore the need to develop effective interventions to prevent the onset of major depression during the perinatal period (Le et al., 2003).

        To date, research evaluating the efficacy and effectiveness of interventions to prevent PPD is mixed (for reviews, see Austin & Lumley, 2003; Dennis, 2004, 2005) – in part because the studies have varied in terms of sample characteristics, sample size, selection of risk factors, intervention content and characteristics, facilitator background and training, and outcome measures. More successful studies have used interventions from either interpersonal psychotherapy (IPT; Zlotnick et al., 2001, 2006) or cognitive-behavioral therapy (CBT; Muñoz et al., 2007). These more recent trials have focused on reducing PPD in low-income and ethnically diverse women. This study built upon the feasibility study conducted by Muñoz et al. (2007), who developed and pilot-tested an English and Spanish CBT group intervention to prevent PPD in a sample of 41 predominantly Mexican immigrant women at high risk for depression (based on high symptom scores and/or a depression history; Le et al., 2001). The intervention, *the Mamás y Bebés/Mothers and Babies Course (MB Course)*, was a 12-week culturally and linguistically appropriate CBT group intervention conducted during pregnancy and four booster sessions in the postpartum period. The majority of their participants were not able to complete all of these sessions (M=6.7, SD=3.8 sessions in the MB Course; M=1.4, SD=1.1 booster sessions). Therefore, for the current study, we shortened the intervention from 12 to 8 sessions, and the booster sessions from 4 to 3, to increase the likelihood of full participation in the intervention.

        This study evaluated the effectiveness of the revised MB course with a larger sample of high-risk Latinas, the largest and fastest growing ethnic minority group and will become the predominant ethnic group by the year 2020 (U.S. Census Bureau, 2004). Our sample, however, differed from those who participated in Muñoz et al.'s (2007) pilot study because the Latino population in Washington DC is comprised of immigrants predominantly from Central America rather than Mexico. The "New Latinas" from Central and South America are the fastest growing Latino ethnic group (Logan, 2001); these families are emigrating to the US for political reasons, as many of their countries of origin have experienced civil war and internal strife (Cervantes, Salgado de Snyder, & Padilla, 1989). They experience a different set of stressors, some of which may be especially harmful to mothers (Goodkind et al., 2008).

III. Study Design and Methods

    A. Study design

    This is a randomized controlled longitudinal trial evaluating the effectiveness of the MB intervention compared to usual care.

    B. Population studied

    This study included a predominantly Central American sample (i.e., the New Latinos).

    C. Sample selection

    Pregnant women in two prenatal care sites in the Washington DC area were approached and invited to participate in the *Mamás y Bebés: Proyecto del Estado de Ánimo y la Salud /Mothers and Babies: Mood and Health Project*. The two sites included a community-based federally qualified health center (FQHC) and a hospital-based clinic that each serve a large percentage of Latinas (approximately 85% and 60% of their client populations, respectively). Women were screened for eligibility (section C.1) either by a trained, bilingual research assistant and/or by clinic staff at the FQHC.

    C.1. Eligibility criteria and randomization. Participants were eligible for this study if they met the following criteria: (a) age 18-35; (b) ≤24 weeks gestation; (c) no smoking, alcohol, or illicit substance abuse; and (d) at high risk for depression—defined as scoring 16 or higher on the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) and/or with a self-reported personal or family history of depression. Exclusion criteria included having a current diagnosis of major depressive disorder, bipolar disorder, psychosis, a serious medical condition, and/or other significant psychosocial problems (e.g., homelessness). In both settings, eligible and consenting participants were administered the baseline interview and then randomized into one of two conditions (MB, UC), using a blocked randomization procedure.

    C.2. Final sample. This sample included 217 participants (112 MB, 105 UC). See section IV.A for detailed findings.

    D. Instruments used

    Participants in both conditions (MB, UC) completed a variety of measures over a five-time period: pre and post 8-week intervention during pregnancy, and 3 times during postpartum (6 weeks, 4-6 months, 12 months). The main constructs and measures of interest included: (a) maternal mental and physical health, (b) risk and protective factors (e.g., stressful life events, social support, partner relationship); (c) cognitive-behavioral outcomes; (d) parenting; (e) infant health and mental health.

    E. Statistical techniques employed

    E.1. Overview of Statistical Methods. To estimate the intent-to-treat (ITT) effects of being offered the MB program, we used regression analysis to compare MB and UC participants. Regression analysis was used to account for small chance differences in the baseline characteristics of the women in the two groups. Linear regression was used for the continuous outcomes. Fisher's exact tests were used for the rare binary outcome of MDE at post-intervention (for extensive discussion of these methods, see Stuart, Perry, Le, & Ialongo, 2008).
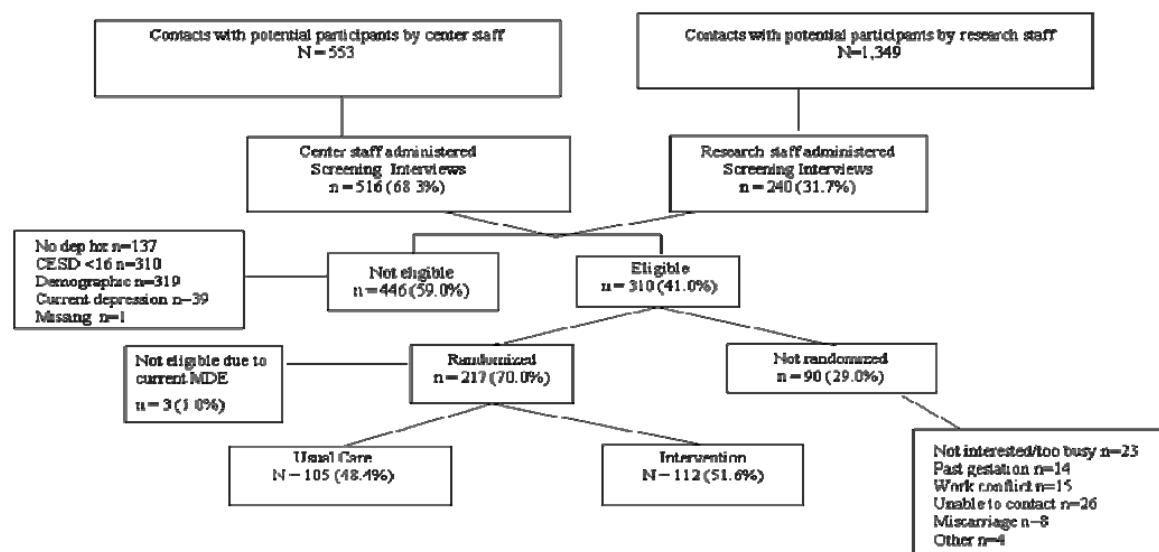
    E.2. Intervention Participation. In addition to estimating the ITT effect of being offered the MB program, we also estimated the effect of *full participation* in the MB intervention (i.e., participation ≥ 4 sessions). To estimate the effect of full participation, we use Complier Average Causal Effect (CACE) methods (also known as Instrumental Variables; Jo, 2002; Little & Yau, 1998). These methods estimate the effect of the program for the compliers—those women who would fully participate if given the opportunity to participate, and who would not participate if not given that opportunity (Stuart et al., 2008).

IV. Detailed Findings

A. Recruitment

Figure 1 summarizes our efforts to screen and enroll participants through ten cohorts, beginning in January, 2005 through December, 2006. Of the 1,902 contacts with potential participants, 1,349 (71%) were approached by research staff and 756 were screened. The actual numbers approached by the center staff but not screened are estimated based upon the center's procedures to screen all pregnant women at the time of their entry prenatal care. Across the two recruitment sites, research staff screened 240/756 women (31%) and clinic staff screened 516/756 women (68.3%), resulting in 310 (41%) eligible participants. Of those eligible, 217 (70.0%) were randomized into the study. The four main reasons for non-randomization included lack of interest, unable to contact, work conflict, and past gestation (Le, Lara, & Perry, 2008).

Figure 1. Recruitment Procedure and Eligibility Screening

Two-hundred and twenty women met eligibility criteria and completed baseline interviews. Three participants were dropped from the study because they met criteria for major depressive episode (MDE) at the time of the baseline interview. The final analysis sample consisted of 217 participants randomized to two groups: 112 to the MB group and 105 to the UC group. More than half of the women, 54.4% (n=118), were from El Salvador, 15.7% (n=34) were from Mexico, 11.1% (n=24) from Honduras, 10.1% (n=22) from Guatemala, and 8.7% (n=17) were from other Central and South American countries, the Caribbean, and the U.S. (n=2). They were, on average 21.6 years of age (SD = 5.1) when they immigrated to the U.S. and lived in the U.S. for an average of 4.3 years (SD = 4.6). Upon entry into the study, participants were, on average, 25.4 years of age (SD = 4.6) and in their 18th week of pregnancy (M=17.7, SD=6.6). They had an average of 8.9 years of education (SD = 4.1). Most participants were married or living with a partner (64%) and were unemployed (64%). Fifty-nine percent of participants' partners were employed, and 90% of the households had an annual income under $30,000.

B. Retention

Extensive efforts were made to follow up all individuals in the original sample, including multiple phone calls, reminder postcards for upcoming intervention classes and interviews, obtaining updated contact information at each follow-up interview, and small retention incentives for mothers (e.g., lotions, holiday cards) and babies (e.g., toys). By Time 2 (at 8 weeks post MB course during pregnancy), 31 (14.3%) of participants were lost to follow-up (n = 186

remaining). By Time 3 (at 6 weeks postpartum), an additional 6 participants were lost to follow-up (n=180 remaining). By Time 4 (4 months postpartum), an additional 6 participants were lost to follow-up (n=174 remaining), and by Time 5 (12 months postpartum), 150 participants completed the interviews. This resulted in a total retention rate of 69.1% at Time 5. The total number of interviews at Time 5 was due to having lost contact to participants over time. Overall, there was a total of formal 20 drops in the study (8 UC, 12 MB). Reasons for these drops included: (a) no longer interested (n=14); (b) miscarriage (n=4); (c) premature birth (n=1); and (d) deceased infant after birth (n=1).

C. Intervention participation

This was calculated in two ways: (a) class attendance, and (b) booster attendance. Intervention participants attended an average of 4.1 (SD = 2.9) of the 8 possible classes during pregnancy. Of these, 11.6% did not attend any classes, and more than half (55.4%) attended 4 or more classes (i.e., completers). There were also three individual booster sessions that took place during the first year postpartum (6 weeks, 4 & 12 months). Intervention participants attended an average of 2 of the 3 booster sessions (SD=1.3).

D. Effectiveness findings

Data were compared between MB and UC participants to examine whether the intervention was effective in reducing depressive symptoms and the onset of major depressive episodes and improving maternal and infant health during the first year postpartum. Specifically, we examined effectiveness data in two ways: (a) short-term effects: baseline data compared to immediately following the MB course during pregnancy (8 weeks post-intervention); and (b) long-term effects: baseline data compared to data at one year postpartum. We also benefited greatly from qualitative data from extensive exit interviews with a randomly selected sample of our participants (n=42).

For the short and long-term effects, four measures were examined for this report: (a) depressive symptoms, as measured by the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996); (b) incidence of major depressive episodes, as measured by the Mood Screener (Muñoz. 1998); (c) overall perceived quality of social support, as measured by the Social Support Apgar (SSA; Norwood, 1996); and (d) ability to regulate one's mood, as measured by the Negative Mood Regulation Scale (NMR; Catanzaro & Mearns, 1990). For the SSA and NMR, higher scores indicate more support and improved perceived abilities to regulate emotions through changing cognitions and behaviors, respectively.

Analyses of the short-term effects of the intervention indicated positive results for depressive symptoms. At post-intervention, the MB group had significantly lower levels of depressive symptoms than the UC group. Additionally, for those women who participated in the majority (≥4) of the classes, we observed larger reductions in mean levels of depressive symptoms. However, there were no differences between condition for social support and mood regulation. The incidence of MDEs (new cases of major depression) was 3.6% (n=3) in the UC compared to 0 (n=0) in the MB group, but this failed to reach statistical significance due to the small number of cases in both the intervention and usual care groups.

Analyses of the long-term effects of the intervention indicate no significant differences between the MB and UC groups in depressive symptoms, social support, and mood regulation skills (see Figures 2-4 for mean levels across the five time points). In terms of incidence of major depression, a total of 7 participants met MDE criteria in the intervention group (7/112 = 6.3%) compared to 6 participants in the UC condition (6/105 = 5.7%), a non-statistically significant difference. Overall, these findings are striking in that there were very few cases of clinical depression in this sample selected to be at high risk for perinatal depression.

Figure 2. Mean Depressive Symptoms by Intervention Group
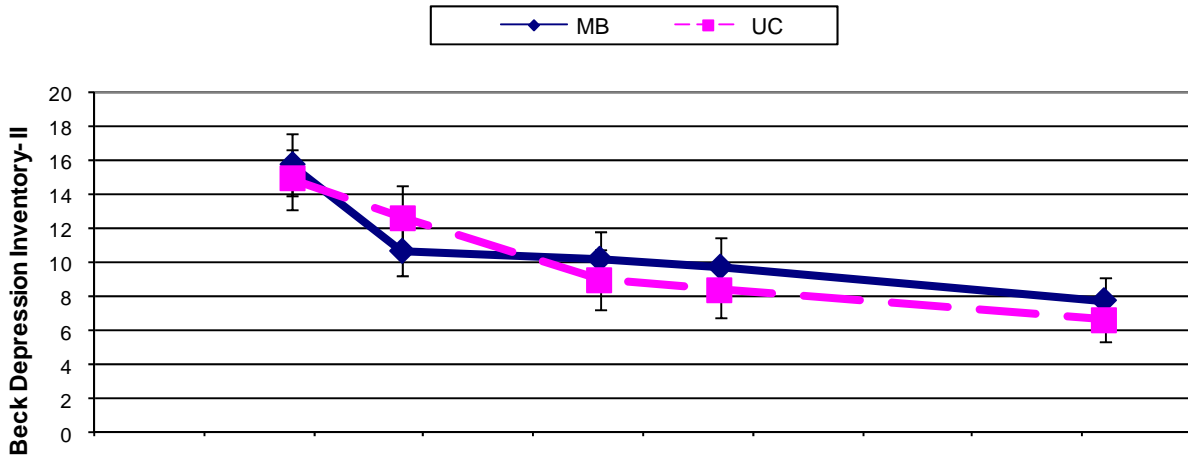**(with 95% confidence intervals)**

Figure 3. Mean Negative Mood Regulation by Intervention Group
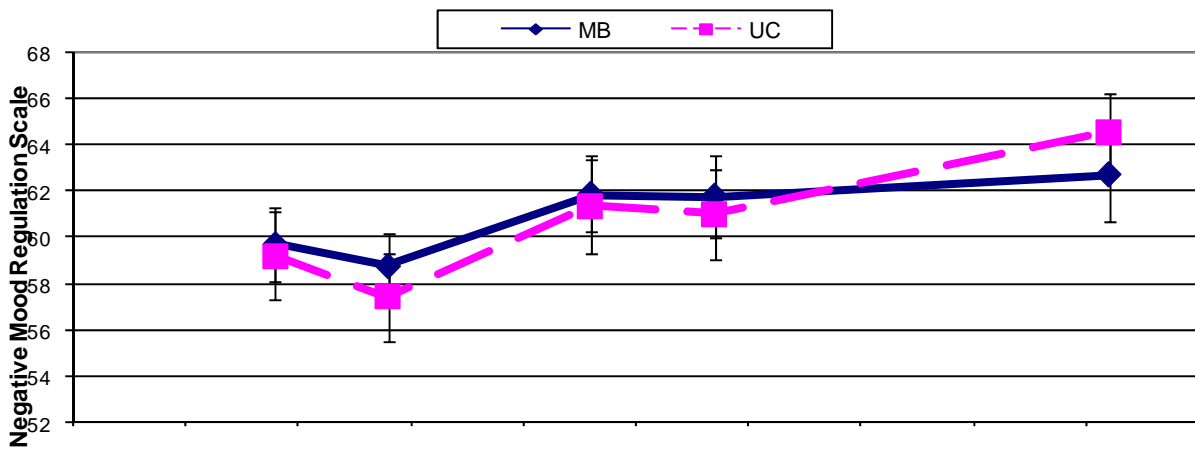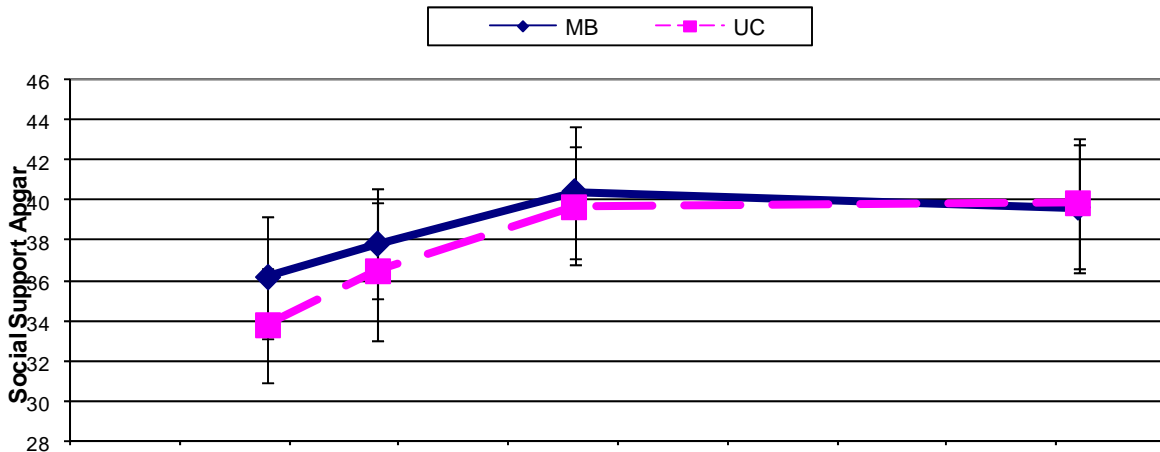**(with 95% confidence intervals)**

Figure 4. Mean Social Support by Intervention Group
(with 95% confidence intervals)

Analyses are also are currently underway to examine other measures in the study, including maternal and infant health outcomes using medical chart data, and mother-infant interactions using videotaped data.

Finally, an exit interview was administered to 42 (25 intervention, 17 UC) of the original 217 participants in the study one to two years postpartum after the conclusion of the study to examine their experiences with the study, resilience and risk factors associated with PPD, and their experiences as immigrants in the US. Preliminary data from 27 participants (15 intervention, 12 UC) suggest that intervention participants indicate that they valued the MB course and learned the main cognitive-behavioral concepts taught in the course (e.g., how to manage their mood, increase social support, increase behavioral activation). Results from the UC participants indicate that they valued the on-going relationship they had with the interviewers; in fact, their experience of being in this study provided them with an important source of support, and that they became more aware of their mood through answering the battery of psychosocial questionnaires multiple times. These findings suggest that the UC group received a supportive and psychoeducational intervention and that this arm of the study is better characterized as a "usual care plus" condition.

V.   Discussion and Interpretation of Findings
   A.   Conclusions to be drawn from findings
   The findings from this study may initially seem disappointing or even paradoxical; indeed, having recruited these women on the basis of the heightened risk for PPD, the low rates of depressive episodes in both the MB and UC groups are striking. Based on the literature (O'Hara & Swain, 1996), we would have expected a minimum of 10 to 15% of our participants to experience a major depressive episode. And yet only 6% in each group reported having significant symptoms and functional impairment consistent with the DSM-IV diagnostic classification. We believe these findings can be understood based on a number of important lessons learned from our research and the literature.

   First, and most importantly, we recruited these women from two primary care clinics where they were receiving prenatal care. Many of these women presented for care in their first trimester, as evidenced by the mean gestational age (18 weeks) for our sample. The majority of our sample was drawn from the Mary's Center for Maternal and Child Care—the preeminent comprehensive health and social service provider for low-income Latinas in Washington DC. Indeed, our partnership with the Mary's Center is one of the strengths of our ability to recruit and retain as many participants as we did—but it also means that these women were receiving a lot of other supportive services (including case management, prenatal classes, WIC, etc.). The support that the Mary's Center offers their clients, added to the support we provided these women—both through participation in the MB course and through our regular contacts with the UC group participants—likely mitigated some of the psychosocial risks with which this sample entered the study.

   Second, the literature is clear that for the first generation of immigrants, many Latina maternal and child health outcomes are far better than those experienced by White or African American native born women (Franzini, Ribble, & Keddie, 2001). While sometimes referred to as the "Hispanic Paradox," working with these women over time has taught us that they are incredibly resilient in the face of great stressors. We were so struck by this during the course of our research that we developed a qualitative interview protocol to explore the sources of this resilience in our exit interviews with 42 women who had completed the study. These participants described drawing strength from many things, including their faith in God, their hopes and dreams for their children's future, and the opportunities that they have created for themselves and their families by coming to this country. It is clear from our work that much more focus

needs to be placed on understanding and measuring the resilience and coping strategies that mitigate risk for these Latina mothers.

Third, although we recruited women at "high risk" for depression, it is possible that there are differential risk groups within this "high risk" group. Our risk group was defined as having a history of depression and/or high depressive symptom scores, because depression history is one of the strongest risk factors for PPD (O'Hara & Swain, 1996). However, other risk definitions have been used that consider multiple risk factors in addition to depression history (e.g., social support, stressful life events) (e.g., Brugha et al., 1998; Zlotnick et al., 2001, 2006). To date, it is unclear which of these risk factors are most salient to target in preventive interventions, and additional research is warranted. In addition, the intervention attendance suggests that only 55% of the intervention group were able to attend 4 or more classes, and 12% were not able to attend any class. And, approximately 30% of participants were lost contact at the end of the study, at 12 months postpartum. Despite our best efforts to contact and retain these participants, it's possible that the ones who did not participate in the intervention and study were the ones who are at highest risk for perinatal depression and the ones most in need of this intervention. These data suggest testing these hypotheses and exploring additional ways to retain participants in prevention research.

Finally, we gained other important insights into the experiences that each group of participants had in the study, and both groups appear to have benefited from their participation. The MB group reported gains in important mood management skills—some of which were not directly measured by the tools we administered in the questionnaires (e.g., relaxation techniques). We believe the low rates of depression in the MB group could be partially attributable to the CBT content delivered through the classes, and reinforced in the booster sessions. In addition, and to our initial surprise, the UC group also reported important benefits from their participation. Indeed, upon reflection, it makes sense that interacting with a compassionate, bilingual (often bicultural) female research assistant five times over the course of the year might serve as a "low-dose" intervention; especially when paired with repeated administrations of questionnaires that ask about one's feelings, mood, relationships with partners, friends and family, this content could also bolster awareness of strategies to cope with stress or depressive symptoms. What our findings suggest is that it may not be necessary to provide women with an evidenced-based curriculum and a highly trained facilitator to realize some benefits. Future studies need to explore which the aspects of a supportive intervention that are important to this population during the perinatal period.

B. Explanation of study limitations

There are several important limitations of this study that also bear on our results. First, we did not use a structured diagnostic clinical interview to determine whether women became clinically depressed during the study; instead we relied on the use of the Mood Screener (Muñoz, 1998), which is based on self-report data but has shown good validation data (Muñoz et al., 1999). We also noted, however, that a number of women (27 UC & 33 MB) reported experiencing 5 or more symptoms consistent with a MDE, but did not report that these symptoms caused them to be impaired in their daily lives. This idea of "functional depression" is one that requires further study, especially in the cultural context of immigrant Latinas' lives. Second, we lost contact with almost one-third of our participants by their end of the first year postpartum. It could be that these were some of the women who became depressed, and this is contributing to our low rates of MDE in both groups.

Third, we are not able to generalize our findings to other groups of Latina immigrants due to the unique partnerships we had with the community clinics in DC. These women were actively

engaged in prenatal care, and our findings would not be representative of other low-income communities where early prenatal care access is not occurring.

C. Comparison with findings of other studies

Our results demonstrate short-term effects of the intervention on depressive symptoms and probable incidence of MDE during pregnancy. These results add to the growing research in prenatal preventive interventions, which to date have had mixed results (Austin & Lumley, 2003; Dennis, 2004, 2005). However, the most recent randomized trials have focused on low-income, ethnically diverse, high-risk samples and demonstrated promising findings at 3 months (Zlotnick et al., 2001, 2006) and 12 months postpartum (Muñoz et al., 2007), utilizing evidence-based interventions to treat depression (e.g., IPT, CBT). Additionally, levels of depressive symptoms in our sample were higher early in pregnancy for both the intervention group as well as those in the usual care condition, and decreased later in pregnancy. These findings are consistent with a systematic review of the prevalence and incidence of perinatal depression, which documented a higher point prevalence for major and minor depression during the first trimester as compared to later in pregnancy (11% versus 8.5%, respectively) (Gavin et al., 2005). Our findings are also consistent with previous studies indicating a linear decrease in depressive symptoms from pregnancy to the postpartum period in Latina samples (Diaz et al., 2007; Zayas, Jankowski, & McKee, 2003). That higher levels of depressive symptoms occur during pregnancy negates the stereotype that pregnancy is a protective factor against depression, further suggesting that a woman's prenatal distress is a significant risk factor for PPD (Beck, 2001) and should be screened.

There were no longitudinal effects of the intervention on the main outcomes (depressive symptoms, MDE incidence, social support, and negative mood regulation). These null findings are consistent with some preventive intervention studies of PPD (Brugha et al., 1998; Buist, Westley, & Hill, 1999; Stamp, Williams, & Crowther, 1995). However, our qualitative data suggest that both intervention and UC participants benefited from the study but in different ways. Additional research is needed to consider which particular aspects of the intervention are worthwhile to retain and test in future trials. Overall, our experience suggests that it is feasible to implement an intervention such as the Mothers and Babies Course with a low-income, low-education, Latina immigrant sample of pregnant women and mothers.

D. Possible application of findings to actual MCH health care delivery situations

Our findings have important implications for MCH practitioners who are serving pregnant Latina immigrants and others who might be at risk for PPD. First, there is a need to include routine screening for depression into routine prenatal care. This is analogous to screening for other conditions, which may have a lower prevalence than PPD. For example, although only 4% of pregnant women develop gestational diabetes, most obstetricians screen all women with a glucose challenge test, regardless of whether they even have specific risk factors for that condition (Gabbe et al., 2004; Getahun et al., 2008). Second, there is a need to expand the range of mental health services available to support women during the perinatal period. Our study underscores the wisdom of integrating behavioral health services into primary care settings, where the women feel comfortable and can access them without stigma. Lastly, our results underscore the need for all MCH practitioners to more systematically assess resilience as often as they assess risk—our field currently lacks the tools needed to develop a complete picture of the strengths and stressors these women bring to their role as a new mother parenting in a different context and culture.

E. Policy implications

In addition to practitioners, policy makers must also embrace the importance of routine screening for depression in prenatal care, as well as other primary care settings. One glaring example of federal policies that undermine efforts to identify perinatal depression is Medicaid regulations that terminate coverage for low-income women 60 days following the birth of their baby. In most states, this results in the mother losing access to medical and mental health treatment at the very time when they are most vulnerable to PPD. Additional policy challenges must be addressed that limit reimbursement for mental health services to only those patients who currently have a diagnosis; this is a barrier to the widespread adoption of more evidence-based, preventive interventions for high-risk groups. Finally, a unique policy barrier that perinatal depression raises is the current focus on one-identified patient; with PPD, there are clear implications for the health and well-being of the newborn. Effective interventions that address PPD must also include services to enhance parent-child interactions. This is particularly important given the reality that these babies are U.S. citizens and part of the future of this country's success.

F. Suggestions for further research

Our lessons learned from this project have informed several new directions for this work. First, we have assembled a multi-disciplinary team to extend the qualitative research that we began through the exit interviews: this will allow us to develop a measure of culturally relevant strengths and stressors that our Latina mothers reported on that could be used in research and practice settings. Second, we are developing a new research proposal to integrate depression screening and a perinatal preventive intervention into the Women, Infants, and Children (WIC) program at the Mary's Center. As one of only a few federal programs that serves pregnant and postpartum women and their children, WIC program offers a unique framework to bridge the gaps in continuity of care for this population. Finally, we are working with a team in Baltimore who are adapting the MB course to be integrated into a home-visiting serving high risk African American pregnant women and new mothers. Overall, we are optimistic about the potential to prevent perinatal depression in low-income ethnically diverse women and encourage further work toward this end.

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VI. List of products

Peer Reviewed Articles
Le, H. N., Sheng, X., & Perry, D. F. (2009). Using the Internet to screen for postpartum
       depression. *Maternal and Child Health Journal, 13*(2), 213-221. Online (2008): DOI
       10.1007/s10995-008-0322-8.
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       prevention programs: Accounting for noncompliance. *Prevention Science, 9*(4), 288-298.
Le, H. N., Lara, M. A., & Perry, D. F. (2008). Recruiting Hispanic Women in the U.S. and
       women in Mexico in postpartum depression prevention research. *Archives of Women's
       Mental Health, 11*(2), 159-169.
Hochhausen, L., Perry, D. F., & Le, H. N. (2008). Neighborhood context and acculturation
       among Central American immigrants. *Journal of Immigrant and Minority Health*.
       Online: DOI 10.1007/s10903-008-9201-z.
Lara, M. A., Le, H. N., Letechipia, G., & Hochhausen, L. (2008). Depressive symptoms and risk
       factors in pregnancy in Latinas in the U.S. and Mexico. *Maternal and Child Health
       Journal.* Online: doi.org/10.1007/s10995-008-0379-4.
Le, H. N., & Boyd, R. C. (2006). Prevention of major depression: Early detection and early
       intervention in the general population. *Clinical Neuropsychiatry, 3*(1), 6-22.
Boyd, R. C., Le, H. N., & Somberg, R. (2005). Review of screening instruments for postpartum
       depression. *Archives of Women's Mental Health, 8*(3)*,* 141-153.

Manuscripts Under Review
Christensen, A., Perry, D. F., Le, H. N., & Ahmed, S. Correlates of unintended birth among low
       income Hispanic immigrants: Implications for family planning programs.
Hochhausen, L., Le, H. N., Perry, D. F. Community-based mental health service utilization
       among low-income Latina immigrants.
Le, H. N., Zmuda, J., Perry, D. F., Muñoz, R. F. Transforming an evidence-based intervention to
       prevent perinatal depression for low-income Latina immigrants.
Le, H. N., Perry, D. F., Stuart, E.A., & Ortiz, G. Evaluating a preventive intervention for
       perinatal depression in pregnant high-risk Latinas.
Le, H. N., Perry, D. F., & Ortiz, G. The utility of the Postpartum Depression Screening Scale-
       Spanish version in predominantly Central American mothers.

Peer Reviewed Presentations
1. Genovez, M., & Le, H. N. (2009, March). *Prenatal Depression in Salvadoran Women in the
       U.S. and in El Salvador.* Poster presented at the Women's Health 2009, 17th Annual
       Congress, Williamsburg, VA.
2. Perry, D. F., Christensen, A. L., & Le, H. N. (2008, November). *Changes in relationship
       quality across the transition to parenthood in Latina immigrant mothers: the impact of
       mental health, pregnancy intention, and partner type.* Paper presented as part of
       symposium at the annual conference of the National Council on Family Relations, Little
       Rock, AR.
3. Hochhausen, L., Ortiz, A., & Le, H. N. (2008, October). *Employment and mental health of
       Latinas in the United States (Empleo y la Salud Mental de Latinas en los EEUU).* Paper
       presented as part of a symposium at the V International Congress on Women, Work, and
       Health. Zacatecas, Mexico.

4. Hochhausen, L., Le, H. N., Perry, D. F., & Ulrich, K. (2008, October). *Stress and depression among Latina mothers with young children.* Poster presented at the annual meeting of the Institute for the Study and Promotion of Race and Culture, Boston, MA.

5. Craig, R. A., Matherne, L., & Le, H. N. (2007, October). *Stressors and coping strategies of postpartum depression in Latina, African-American, and European-American mothers*. Poster presented at the annual meeting of the Institute for the Study and Promotion of Race and Culture, Boston, MA.

6. Schaefer, K., Hochhausen, L., & Le, H. N. (2007, August). *Prevalence and risk factors for depression during pregnancy in Latinas.* Poster presented at the annual meeting of the American Psychological Association, San Francisco, CA.

7. Le, H. N., Perry, D. F., & Ortiz, G. (2007, July). *Preventing postpartum depression in a community health setting in Washington DC, U.S.A.* Paper presented as part of symposium at the Xth European Congress of Psychology, Prague, Czech Republic.

8. Perry, D. F., Le, H. N., & Ortiz, G. (2007, May). *Preventing postpartum depression in high-risk Latinas.* Poster presented at the annual meeting of the Society for Prevention Research, Washington, DC.

9. Perry, D. F., Le, H. N., & Yengo, J. (2007, May). *Listening and learning: An authentic dialogue between researchers and community members.* Paper presented as part of symposium at the annual meeting of the Society for Prevention Research, Washington, DC.

10. Hochhausen, L., Ortiz, A. , Perry, D. F., & Le, H. N. (2007, May*). Booster sessions: Development, completion, and outcomes in the context of a preventive intervention for postpartum depression.* Poster presented at the annual meeting of the Society for Prevention Research, Washington, DC.

11. Berbery, M. L., Le, H. N., & Perry, D. F. (2007, March). *Factors associated with participation in depression prevention research in low-income Latinas.* Poster presented at the Society for Community Research and Action, Annual meeting of the Eastern Psychological Association, Philadelphia, PA.

12. Sheng, X., Le, H. N., & Matherne, L. (2006, August). *The Internet as a potential tool to assess postpartum depression.* Poster presented at the annual meeting of the American Psychological Association, New Orleans, LA.

13. Le, H. N., & Perry, D. F. (2006, May). *The Mothers and Babies: Mood and Health Project in Washington DC.* In H. N. Le (Chair), *Depression Prevention Research in Latinas and Families in the U.S. and Mexico.* Paper presented as part of symposium at the annual meeting of the Society for Prevention Research, San Antonio, TX.

14. Le, H. N., Lara, M. A., & Ortiz, A. (2006, May). *Experiences of two randomized controlled trials aimed at preventing perinatal depression: A U.S. and Mexico collaboration.* In H. N. Le (Chair), *International Collaborations for Prevention Research with Latinos: Opportunities and Challenges.* Roundtable presented at the annual meeting of the Society for Prevention Research, San Antonio, TX.

15. Hochhausen, L., Le, H. N., & Perry, D. F. (2006, March/April). *Evaluating participant satisfaction of a preventive depression intervention in high-risk Latina pregnant women.* Poster presented at the Annual Conference of the Association for Women in Psychology, Ypsilanti/Ann Arbor, MI.

16. Boyd, R. C., Le, H. N., & Somberg, R. (2005, August). *Screening instruments for postpartum depression.* Poster presented at the annual meeting of the American Psychological Association, Washington, DC.

Presentations (Invited)
1. Le, H. N. (2008, December). *The Mothers and Babies Course: A cultural adaption of a preventive intervention for postpartum depression for Latinas.* Second international conference on intervention and prevention of Vietnamese children's mental health problems, Hanoi, Vietnam.
2. Le, H. N. (2008, December). *The Mothers and Babies Course: A Cultural Adaptation of a Preventive Intervention for Postpartum Depression for Latinas.* Second international conference on intervention and prevention of Vietnamese children's mental health problems, Hanoi, Vietnam.
3. Perry, D. F. (2008, April). *Perinatal depression: Impact on women and children.* Keynote address at the 34th Statewide Conference on Perinatal Medicine, Des Moines, IA.
4. Perry, D. F. (2008, April). *Systems of care for perinatal depression.* The Illinois Perinatal Depression Peer Review meeting, Chicago, IL.
5. Le, H. N. (2007, October). *Preventing postpartum depression in high risk Latinas.* Seminar series in gender and mental health. Department of Mental Health, Johns Hopkins University, Baltimore, MD.
6. Le, H. N. (2007, October). *Preventing perinatal depression in community health settings.* The plenary on Perinatal Depression. Maternal and Child Health Federal/State Partnership Meeting, Alexandria, VA.
7. Perry, D. F. (2007, August). *Building systems of care for perinatal depression.* Keynote address at MCHB Healthy Start National Meeting, Crystal City, VA
8. Perry, D. F. (2007, February). *Preventing postpartum depression in low-income Latinas.* Psychiatry Grand Rounds, Tulane University, New Orleans, LA.
9. Le, H. N., & Lara, M. A. (2006, November). *Experiences of two randomized controlled trials aimed at preventing perinatal depression: A U.S. and Mexico collaboration.* Ramón de la Fuente National Institute of Psychiatry, Mexico City, Mexico.
10. Le, H. N. (2006, November). *Depression during pregnancy and the postpartum period: Prevalence, risk factors, prevention, and treatment.* Invited workshop at the Ramón de la Fuente National Institute of Psychiatry, Mexico City, Mexico.
11. Le, H .N. (2005, November). *Preventing postpartum depression in low-income Latinas.* Neuropsychology/Neuroscience Grand Rounds. Mount Washington Pediatric Hospital, Baltimore, MD.

Master and Doctoral Dissertations
Christensen, A. (2008-2009). *Unintended pregnancy as a predictor of perinatal depressive symptoms in Latina immigrants: A longitudinal study.* Preliminary oral exam completion (2008); final defense expected (December, 2009). For fulfillment of a Ph.D. at Johns Hopkins Bloomberg School of Public Health.
Lindenstruth, K. (2008). *Predictors of mother-infant attachment during the early postpartum period.* Fulfillment of Masters of Public Health capstone at Johns Hopkins Bloomberg School of Public Health.
Zmuda, J. (2008). *Mamás y Bebés: A culturally-adapted postpartum depression intervention for Latinas in Washington, DC.* Fulfillment of Masters of Public Health capstone at Johns Hopkins Bloomberg School of Public Health.
Hochhausen, L. (2007). *Mental health treatment seeking among low-income immigrant Latinas.* Fulfillment of Masters of Philosophy at George Washington University.