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Patterns of Depression Among Adolescent Mothers:

Resilience Related to Father Support and Home Visiting Program

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Abstract

The negative consequences of maternal depression are a major public health concern, both for mothers and for their children. Despite the high prevalence of depression among adolescent mothers, little is known about the patterns of adolescent mothers' depression in the early parenting years. The present study examined mothers' depression during the first two years following childbirth in a sample of 428 young mothers (20 or younger at first childbirth) who were participants in a randomized controlled trial of Healthy Families Massachusetts, a home visiting parenting support program. Depressive symptoms were assessed using the self-reported Center for Epidemiological Studies depression questionnaire (CES-D). Mothers were classified into groups based on whether their depressive symptoms were below or above the cutoff for clinically-significant symptomatology. Depression groups (stable nondepressed, stable depressed, remitted depression) were associated with variations in mothers' satisfaction with support from the baby's father, and enrollment in the home visiting program. Maternal depression was more likely to remit when mothers were satisfied with father support; assignment to the home visiting program was associated with mothers remaining mentally healthy. Results have clinical and policy implications for prevention and intervention programs.

Patterns of Depression Among Adolescent Mothers: Resilience Related to Father Support and Home Visiting Program

Maternal depression is a serious mental health concern for families and for public health. Depression occurs frequently among mothers of young children, with estimates ranging from 15%-25% of mothers experiencing postpartum depression in the two years following childbirth (Evans, Heron, Francomb, Oke and Golding, 2001); these rates may double among samples at socioeconomic risk (Mora, Bennett, Elo, Mathew, Coyne, & Culhane, 2009). Maternal depression has serious consequences for mothers, providing challenges to maintaining secure employment and sensitive parenting (Field, 2010) and for their children, who demonstrate adverse socioemotional, behavioral, and cognitive development (Goodman, Rouse, Connell, Broth, Hall, & Heyward, 2010). The negative developmental consequences of maternal depression for mothers and their children are particularly robust when depression occurs during a child's infancy (Bureau, Easterbrooks, & Lyons-Ruth, 2009) or when depression is chronic or recurrent (Ashman, Dawson, & Panagiotides, 2008), which is the case for 30-50% of adults. In the present study, we aimed to examine patterns of depression in young mothers during the first two years of parenting, and to investigate whether stability of mothers' depressive symptoms, or resilience to early depression, was related to aspects of her social context, specifically her relationship with the father of her child, and her participation in a prevention-based family support home visiting program.

Young mothers, in particular, are at risk for elevated prevalence of depressive symptoms, and rates of postpartum depression among adolescent mothers may be double that of older mothers (Lindhorst & Oxford, 2006; Molborn & Morningstar, 2009). Not only is depression prevalent among adolescent mothers, it also may be chronic and difficult to remit among this group (Ammerman et al, 2009). The challenges in treating and reducing existing depressive symptoms may result, in part, from difficult life circumstances and adversities that both precede and accompany adolescent motherhood and that are associated with depression (e.g., low social and economic resources; trauma; social isolation; Hodgkinson, Beers, Southammakasone, & Lewin, 2014). Since young mothers are a

population at risk for depression, having a better understanding of the contexts and circumstances associated with chronic and remitted depression is important to supporting effective interventions.

Longitudinal Patterns of Maternal Depression

Although early maternal depression tends to persist across the early years of parenting (Brown, Harris, Woods, Buman, & Cox, 2012; Gavin, Lindhorst, & Lohr, 2011) this pattern is not uniform, suggesting substantial discontinuity and resilience. In a study of primiparous high-risk mothers enrolled in a home visiting program, Ammerman and colleagues (2009) found that half of mothers who showed elevated symptoms in the prenatal or early postnatal period were no longer depressed nine months later. Another study that examined patterns of depression (Ashman et al., 2008) found three trajectories: "chronic severe" (high and stable symptoms), "decreasing" and "stable-mild" (low and stable symptoms). We were interested in investigating a) whether we would observe patterns of stable depression and decreasing depression in a sample of young mothers at high risk for depression in the early years of parenting, and b) whether stability or resilience in early depression would be associated with protective factors in a young mother's environment (e.g., perceived support from the father, and the social resource of a home visiting program).

Resilience Framework

The present study operates from a resilience framework whereby remitted depression (high symptoms that later abate) may be seen as an indicator of resilience, defined as positive adaptation in the face of adversity (Luthar, Cicchetti, & Becker, 2000). Applying this approach to our study, we expected that the presence of contextual supports (such as accessible and healthy interpersonal relationships, and environmental resources) would foster positive patterns of mental health (e.g., remission/recovery from depression or maintenance of positive mental health in the context of risk factors associated with maternal depression). In a resilience framework, protective factors (such as positive social relationships and support, and availability of prevention programs) modify the negative

effects of risk in a positive direction. They may operate only in situations of adversity, thus their impact may be lessened or absent in low-risk circumstances (Luthar et al., 2000).

Prominent among protective factors are the relationships that provide social support in the form of emotional, informational, and material/tangible assistance (Shaefer, Coyne, & Lazarus, 1981). Both proximal support (e.g., father of baby, family, friends) or more distal sources of support (e.g. community-based services) may alter the developmental trajectory of depression by buffering against stress (Cohen & Wills, 1985). Adolescent mothers tend to experience heightened social isolation, thus social support may take on greater importance in the mitigation of their depressive symptoms (Nunes & Phillips, 2013). The present study focuses on two indicators of social support: a mother's perceived support from the father of her baby, and enrollment in a home visiting service program.

Fathers and Program Services as Providers of Social Support

Fathers are primary providers of social support to mothers, including adolescent mothers, during the transition to parenthood (Gee & Rhodes, 2003), assisting a mother in meeting the difficult challenges of parenting. A father-mother relationship can be a potent source of social support and a significant contributor to maternal psychological well-being (Fagan & Lee, 2010; Kalil, Ziol-Guest, & Coley, 2005). Unfortunately, father support, involvement, and the quality of the mother-father relationship among adolescent-mother families tend to decline quite quickly across the first couple of years following childbirth (Hofferth & Goldschieder, 2010; Kalil et al, 2005). Given the dynamic nature of mother-father relationships, particularly among adolescent parents (Coley & Hernandez, 2006), it is important to examine the impact of mothers' satisfaction with the father-mother relationship on maternal depression beyond the early postpartum period.

In addition to social support provided via close relationships, more distal sources of social support (e.g., service programs) can buffer the stressors of parenting. Home visiting is a popular mode of service delivery in providing services to families with young children (Daro & Dodge, 2010). Services may be provided by professionals with a particular set of credentials, or by paraprofessionals (Olds et al., 2007). Home visiting may be effective in supporting parenting and children's development (Avellar & Supplee, 2013), but reviews of home visiting evaluations suggest that standard home visiting programs are unlikely to reduce depression among all program participants (Ammerman, Putnam, Altaye, Stevens, Teeters, & Van Ginkel, 2013; Jones Harden, Chazan-Cohen, Raikes, & Vogel, 2012; Mitchell-Herzfeld, Izzo, Greene, Lee & Lowenfels, 2005) since they typically are not designed to provide treatment for depression. Still, there may be favorable impacts of home-visiting for some subgroups of mothers.

Research Questions of Current Study

Based on resilience theory and the literature regarding patterns of maternal depression across the transition to parenthood, we examined three patterns of maternal depressive symptoms (stable nondepressed, stable depressed, depression remits). To investigate whether mothers' satisfaction with support provided by the father of the baby and participation in a home visiting program would operate as protective factors in the remission of depression, the model tested the odds of belonging to the *stable depressed* and *stable non-depressed* groups, relative to the *remits* group. Given that the *stable depressed* and *remits* groups were both depressed at Time 2 but differed with respect to their later depression, we hypothesized that (a) maternal satisfaction with the support provided by the father of the baby, and (b) assignment to a home visiting program would operate as protective factors, predicting remitted depression at T3 (relative to the stable depressed group). The intent of including the third group, *stable non-depressed* group, was to ascertain that, as the definition of protective factor suggests, mothers' satisfaction with support provided by father and participation in a home visiting program would be protective only in the face of vulnerability, i.e., prior depression. Our prediction was that mothers'

satisfaction with father support and participation in a home visiting program would distinguish mothers who remitted from mothers who were stable depressed, but not from mothers who were stable non-depressed. Because our focus was on resilience rather than risk, we did not examine the group that were initially healthy and later became depressed. Furthermore, given the possible impact of home visitation for particular subgroups of mothers, it was predicted that the formal support of home visitation would be apparent for mothers who were not satisfied with the support provided by the father.

Method

Sample

Data were drawn from a longitudinal randomized controlled trial evaluation of Healthy Families Massachusetts, a paraprofessional child maltreatment prevention home visiting program for first-time adolescent parents under the age of 21. Mothers (n = 837) were randomly assigned to program and control groups (517 – HVS, home visiting services; 320 control – RIO, referral and information only). Eligibility criteria for the evaluation included: being female, 16 years or older, no prior receipt of services from the program, being an English or Spanish speaker, and being cognitively able to provide informed consent. 704 mothers (433 program; 271 control) participated in, at minimum, an initial (Time 1, T1) phone interview or signed a release allowing access to data from state agencies. Most of these mothers participated in phone data collection at all three time points (n = 531). All measures used in this study were drawn from phone interviews.

The present sample consisted of 428 mothers who provided depression data at each time point (T1-T3). These mothers were similar on most demographic characteristics examined in Table 1 to mothers who did not provide depression data at all time points except they were more likely to be Black, non-Hispanic; preferred English; were born in the US; had younger children; and had higher median income household than those who did not.

Procedures

Data were collected just after study enrollment (T1), 12 months (Time 2, T2), and 24 months after enrollment (Time 3, T3). Study protocols were approved by the university's Institutional Review Board; participants' informed consent was required prior to procedural administration. Full details of the evaluation have been presented elsewhere ([blinded for review]); only methods relevant to the present analysis are presented here.

Measures

Family demographics (T1). Demographic characteristics included: child's age and sex, maternal age at birth and at enrollment, maternal education, parenting status at enrollment, whether mother used welfare services since becoming pregnant, whether mother received mental health services, maternal primary language, maternal self-reported ethnicity, maternal place of birth, father of baby ethnicity, and community (Census block) characteristics (percent minority, population density, and median household income according to 2010 Census).

Mothers' satisfaction with father support (T2). Mothers were asked to indicate how satisfied they were with the quality of time the father spent with them, according to the following categories: *not at all satisfied or father did not spend time with the mother* (0), s*omewhat* (1), *pretty much satisfied* (2), and *very satisfied* (3). Data from T2 were used in the study, as most mothers were still pregnant at T1.

Depressive symptomatology (T1, T2, T3). The 20-item self-report Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) questionnaire was used to assess depressive symptoms. The CES-D assesses symptoms experienced during the past week (e.g., "I felt that I could not shake off the blues even with help from my family or friends") rated on a four-point Likert scale (0 = *not at all*, 3 = *a lot*). Scores of 16 or higher are considered to be "clinically significant" (Radloff, 1991). A dichotomous

score was created, in which 0 denoted symptoms below the clinical threshold, and 1 denoted endorsing clinically-significant symptomatology.

The CES-D has demonstrated strong psychometric properties in both clinical and epidemiological studies with diverse groups, including adolescents, and pregnant and postpartum women (Diego, Field, & Gonzalez-Quintero, 2009; Radloff, 1991). The reliability and validity of the CES-D are well-established, with 100% sensitivity with a clinical diagnosis, and 88% specificity (Radloff & Locke, 1986). The dichotomous score has been widely used in the literature as a reliable, cost-effective measure reflective of a range of depressive symptoms that is typically associated with the clinical diagnosis of depression (Field, 2010).

Data Analysis

Participants were divided into the following groups based on their depression cutoff scores at T2 and T3[1] *(1) stable non-depressed* (below clinical cutoff at both times; *n* = 265); *(2) stable depressed* (above clinical cutoff at both times; *n* =83); *(3) depression remits* (above clinical cutoff at T2, but not at T3; *n* = 80). Mothers whose depression scores were below clinical cutoff T2, but above the cutoff at T3 (*n* = 68) were excluded to allow us to focus on the specific research questions we proposed.

A series of multinomial logistic regression models were run to, first, predict membership in the depression trajectory groups from home visiting program status and mothers' satisfaction with father support; and second, evaluate whether mothers' satisfaction with father support moderated program effect depression trajectories. We tested this possibility by creating an interaction term with the measures of maternal satisfaction with the father and random assignment status. We controlled for depression at T1, receipt of mental health services at T2, maternal age at birth, and child's age at T2. All study variables were entered simultaneously. When the interaction term was not significant, it was excluded from the final model.

[1] We controlled for depression scores at T1, but did not use them in creating the groups, because most participants were still pregnant at T1.

Missing data. The degree of missingness ranged across the different variables included in the analysis for the analytic sample (M = 19.5%; range 0-30%) due to attrition as well as other unforeseeable data collection challenges (e.g., skipping items unintentionally, refusal to answer). The Little's MCAR test (Chi-square = 4.388, df = 5, p = .495) was non-significant, which means that data were missing completely at random (MCAR; Little & Rubin, 2002). When data are MCAR, the results from analyses using complete data will be similar to results with imputed data. For this reason, listwise deletion was used, as it offered the most straightforward presentation of the results.

Results

Characteristics of the Three Depression Groups

Figure 1 illustrates how the depression groups were created. At each time point, the sample was divided between those who scored above the cut-off for depression (circle) and those who did not score above the cut-off for depression (square). About a third (38.1%) of the mothers had clinically high levels of depressive symptoms at Time 2. Of them, about half recovered by Time 3 (*remits* group, 18.7% of the total sample) and about half remained depressed (*stable depressed* group, 19.4% of the sample). Mothers who were asymptomatic at both time points (*stable non-depressed* group) formed the largest group (61.9%). Again, those who had depressive symptoms below the clinical cutoff at T2, but who exhibited symptoms above the clinical cutoff at T3 (*becomes depressed* group; n = 68) were excluded from the analysis because this paper focused on the resilience of mothers experiencing early depression.

<< Insert Figure 1 about here >>

Results of bivariate analyses using chi-square and ANOVAs showed that mothers in the three depression groups had similar child, parent, family and environmental demographic characteristics (see Table 1). However, the groups differed with respect to mothers' satisfaction with father support at Time 2 ($\chi^2(6)$ = 33.46, p = .000). Specifically, mothers in the *stable non-depressed* had

the highest satisfaction (M = 2.32, SD = .90). Mothers in the *stable depressed* group had the lowest satisfaction (M = 1.44, SD = 1.02), while mothers in the *remits* group were moderately satisfied (M = 1.98, SD = 1.06). Groups also differed significantly on the measure of depression at Time 1 (($\chi^2(2)$ = 73.69, p = .000): mothers who were *stable non-depressed* (79.5% were asymptomatic) were more likely to score below the clinical-cutoff at T1 than mothers in *remits* (49.4% asymptomatic) or *stable depressed* (30.9% asymptomatic) groups. Furthermore, groups differed with respect to their receipt of mental health services at T2 ($\chi^2(2)$ = 26.46, p = .000): *Stable depressed* mothers were receiving mental health services at the highest rate (46.3%), followed by mothers in *remits* (38%) and *stable non-depressed* (19.7%) groups.

<< Insert Table 1 about here >>

Predicting Depression Pattern Classifications

Results of a multinomial logistic regression model (based on T2 and T3 scores) predicting membership in *stable depressed* and *stable non-depressed* groups relative to *remits* group are summarized in Table 2. Mothers' satisfaction with father support did not moderate the relation between intervention status (HVS vs. control) and depression groups. Thus, interaction terms were removed from the final model. Mothers had a lower likelihood of being in the *stable depressed* group than the *remits* group if they had higher satisfaction with father support (OR = 0.48, p = .002). Satisfaction with the father did not predict membership in the *stable non-depressed* group, relative to the *remits* group (OR = 1.17, p = .429).

Mothers had higher odds of being in the *stable non-depressed* group than *remits* group if they were in the intervention group assigned to home visitation services; (OR = 2.56, p = .012). Intervention group did not distinguish *stable depressed* and *remits* groups.

Time 1 depression significantly predicted membership in the three depression groups. Mothers were more likely to be in the *stable depressed* group than in the *remits* group if their depression scores were above clinical cutoff at Time 1 (OR = 4.00, p = .003).

Scores above the clinical cutoff at Time 1 also predicted lower likelihood of being in the *stable non-depressed* than the *remits* group (*OR* = 0.31, *p* = .002). Use of mental health services at T2 predicted lower likelihood of being in the *stable non-depressed* group than *remits* group (*OR* = 0.34, *p* = .009).

<< Insert Table 2 about here >>

Discussion

The results of this study support a resilience perspective, and confirm that patterns of maternal depression across the first years of parenthood among adolescent mothers are related to contextual characteristics--mothers' satisfaction with father support and assignment to Healthy Families Massachusetts, a home-visiting parent support program. Half of the study mothers remained healthy (non-depressed) across the transition to parenthood, but the other half experienced clinically-significant depressive symptoms (some of them recurrent) during the first two years of parenting. Although these data on the prevalence of maternal depression are alarming, they are not surprising. The literature is replete with studies showing similar elevated rates of depression among low-income samples, and among adolescent mothers (e.g., Ammerman et al., 2009; Molborn & Morningstar, 2009). At the same time, there is a paucity of information about what aspects of a young mother's relationships or social context might be related to the course of depression. Utilizing a resilience framework, our results provide evidence of the importance of both proximal relationships (i.e., relationship with father of baby) and more distal support (i.e., formal family support program) in maternal mental health.

The Importance of Close Relationships and Formal Support Systems

Mother-father relationships are a primary support system for mothers during the transition to parenthood, affecting both a mother's well-being and her parenting (Gee & Rhodes, 2003; Kalil et al., 2005). In this study, depressed mothers who remained depressed a year later were the least satisfied with the support provided by the father of their child. Results highlighted the protective

role that support from this relationship may play in the remission of maternal depression over the course of early parenthood. Mothers whose depression remitted expressed greater satisfaction with father support compared to mothers who remained depressed.

Social support may be provided by people who are members of a mother's close social network--family and friends--and also by more formal sources of support, such as service programs that provide prevention or intervention services. It was beyond the scope of this study to examine the potential moderating role of support provided by other important members of a mother's social network--family and friends. We did, however, examine one indicator of formal support—Healthy Families Massachusetts, a home visiting program. Although it was not expected that the home-visiting program would exert a strong main effect on depression patterns, since the program did not contain a component aimed at preventing or reducing depression (Ammerman et al., 2013; Mitchell-Herzfeld et al., 2005), the results showed that mothers were more likely to remain psychologically healthy (compared to having high depressive symptoms that later remit) if they were assigned to the home-visiting group. This suggests that mothers with low initial depressive symptoms may be more easily engaged by home visitation and may more able to benefit from the intervention. Depressed mothers can be difficult to engage in support programs (Ammerman et al., 2011), and having a provider come into one's home may also be stressful for depressed mothers (Nylen, Moran, Franklin, & O'Hara, 2006). Strategies to engage and support depressed mothers might include a depression intervention component for participants who enter the program with high levels of depressive symptoms, and/or conducting rigorous screening and then referrals to program partners trained to provide these services (Ammerman et al., 2013).

Limitations of the Present Study

Although the data support a resilience framework in that support from fathers was associated with remitted depression, the effect of home visitation in the maintenance of good mental health among women who were not already depressed might be seen as operating in a promotive fashion rather than one that interrupts a negative trajectory to foster resilience to risk. At the same time, a

prominent predictor of later depression was the initial extent of depressive symptoms, suggesting some role for continuity of mental health experience separate from our measures of social support. Both conceptually and statistically, one would expect that earlier depression would account for most of the variability in later depression; after controlling for the fact that depression often is chronic and recurrent, father and home visiting support explained additional variability in depression patterns.

One study limitation is that the assessment of support in the mother-father relationship was via maternal report of satisfaction with the quality of time that the father spent with them. Although this measure has demonstrated robust associations with other measures of father involvement and relationship quality [Easterbrooks, Raskin, & McBrian, 2014]), more might be learned about the links between mother-father relationships and depression patterns by assessing a broader view of the mother-father relationship, or by assessing fathers' perspectives. We also did not measure other aspects of social support (e.g., grandparent, other romantic relationships, friendships) that may contribute meaningfully to a mother's depression. In addition, perceptions of social support may be systematically biased among depressed mothers; indeed, research shows that depressed individuals may be especially sensitive to experiences of both social acceptance and rejection, and may perceive social support differently than those who are not depressed (Steger & Kashdan, 2009).

This study's measure of maternal depression was a self-report instrument rather than a clinical diagnostic assessment, and not all mothers with elevated symptoms would meet the diagnostic criteria for Major Depressive Disorder. A related limitation is our use of cutoff scores that represent "clinically-significant" levels of depressive symptoms as a way to create distinct categorical groups. While this is a validated and commonly used approach (Boyd, Weissman, Thompson, & Myers, 1982), it has the limitation that individuals on either side of the cutoff may be very similar, but are assigned to different groups.

Finally, we cannot conclude causal effects; although we think it is likely that a mother's evaluation of the relationship that she has with the father of her child may contribute to patterns of depressive symptoms, there are other explanations as well. An alternative rationale may be that depressive symptomatology influences a mother's satisfaction with the relationship.

Conclusions

Despite these limitations, this investigation makes several contributions. The study uses longitudinal data to explore changes in depression over the early years of parenthood. The present study also highlights the important role that relationships – both with the father of the baby as well as with home visitors in a home visiting program – can play in mothers' experiences with depression. In general, the status of adolescent mother-father relationships is likely to be unstable (Hofferth & Goldschieder, 2010), and father involvement declines quite steeply in the first couple of years following childbirth (Kalil et al., 2005). This may suggest that paying attention to the mother-father relationship and the stability of father involvement may aid family support programs in building support for mothers in the transition to parenthood. These results have other important policy implications, suggesting that home visiting programs may be better able to prevent maternal depression than to abate clinically-significant symptoms.

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Table 1

Depression groups Descriptives (n = 428)

	Full sample (n=428) %/*M* (*SD*)	Stable non-depressed (*n* = 265) %/*M* (*SD*)	Stable-depressed (*n* = 83) %/*M* (*SD*)	Remits (*n* = 80) %/*M* (*SD*)
CES-D score above clinical cutoff (T1)	35.5%	20.50%	69.10%	50.60%
CES-D summary score (T1)[a]	14.31	10.49	22.77	17.09
	(10.65)	(8.17)	(11.99)	(11.48)
CES-D summary score (T2)[a]	12.89	6.57	26.23	24.20
	(10.45)	(4.12)	(9.10)	(7.93)
CES-D summary score (T3)[a]	12.27	6.17	24.04	8.46
	(9.71)	(4.13)	(6.54)	(3.95)
Satisfaction with time father spends	2.10	2.32	1.44	1.98
with mother[a,]	(1.01)	(0.90)	(1.02)	(1.06)
Intervention status (HVS)	58.4%	61.10%	57.80%	50%
Number of home visits (only for HVS)	27.61	27.80	25.65	29.20
	(27.94)	(27.60)	(30.31)	(26.95)

Length of enrollment (in days; only for HVS)	501.46 (406.10)	521.98 (415.48)	438.79 (390.77)	493.55 (386.86)
Mother age at enrollment (years)	18.62 (1.24)	18.64 (1.28)	18.51 (1.21)	18.66 (1.32)
Father's age at enrollment (years)	20.79 (3.94)	20.83 (4.07)	20.92 (3.75)	20.53 (3.94)
Mother's age at birth of child (years)	18.77 (1.24)	18.79 (1.26)	18.64 (1.16)	18.82 (1.24)
Mother parenting at enrollment (vs. pregnant at enrollment)	35.5%	36.60%	34.90%	32.50%
Baby age at T1 (months)[b]	4.49 (4.03)	4.17 (4.00)	4.24 (4.13)	5.40 (4.40)
Baby age at T2 (months)	11.86 (5.35)	11.85 (5.09)	11.89 (5.80)	11.86 (5.66)
Baby age at T3 (months)	24.20 (6.04)	23.90 (5.89)	24.58 (6.58)	24.66 (5.91)
Baby is female	48.6%	46.40%	53.0%	51.30%
Mother's race/ethnicity				
White (non-Hispanic)	38.00%	37.60%	36.10%	41.30%

Black (Non-Hispanic)	20.90%	24.30%	16.90%	13.80%
Hispanic	33.80%	31.60%	38.60%	36.30%
Other (Non-Hispanic)	7.30%	8.80%	8.40%	8.80%
Father of baby race/ethnicity				
White Non-Hispanic	29.50%	27.10%	32.50%	34.20%
Black Non-Hispanic	21.70%	25.50%	16.30%	15.20%
Hispanic	10.60%	11.40%	11.30%	7.60%
Other	38.20%	36.10%	40.00%	43.00%
Mother born in Massachusetts	69.60%	71.70%	61.40%	70.90%
Mother place of birth				
United States	82.70%	83.40%	79.50%	83.50%
US Territory	4.70%	3.80%	7.20%	5.10%
Outside of US	12.60%	12.80%	13.30%	11.40%
Mother preferred language				
English	77.40%	78.70%	76.80%	73.40%
Spanish	3.30%	3.40%	3.70%	2.50%
English and Other	18.90%	17.50%	18.30%	24.1%
Other	0.50%	0.40%	1.20%	0.00%
Mother relationship status (T2)				

Single	34.70%	34.70%	36.10%	32.90%
Dating father of baby	17.30%	17.00%	16.90%	19.00%
Engaged/committed to father of baby	29.0%	30.90%	22.90%	29.10%
Married to father of baby	4.90%	4.50%	2..40%	8.90%
Dating someone else	7.50%	6.40%	12.00%	6.30%
Engaged/committed to someone else	5.90%	6.00%	8.40%	2.50%
Married to someone else	0.70%	0.40%	1.20%	1.30%
Mother lives with father of baby (T2)	32.90%	28.90%	29.60%	38.00%
Census 2010, block group data				
Median household income (thousands)	49.75 (27.62)	50.11 (26.79)	48.16 (28.00)	50.20 (30.12)
Density: persons per dry square mile (thousands)	12.48 (12.42)	13.08 (12.93)	11.53 (12.99)	11.47 (97.93)
Percent minority	46.68%	47.13%	43.53%	45.30%
Mother finished high school/GED (T1)	35.00%	34.30%	34.10%	38.50%
Received welfare services (T1)	24.10%	26.00%	23.20%	19.00%
Received mental health services (T2)[a,]	28.20%	19.70%	46.30%	38.00%

Note: CES-D = Center for Epidemiological Studies Depression Scale; T1 = Time 1; T2 = Time 2; T3 = Time 3.

[a]Significant group difference ($p < .05$).

[b]Age of children (in months) whose mother have already given birth at T1.

Table 2

Final Multinomial Logistic Regression Models Predicting Membership of Depression Groups (n = 428).

	OR (CI) *p*
Stable depressed group	
Depression (T1)[b]	4.40 (1.65-11.75) .003
Mother age at birth (years)	.76 (.54-1.08) .126
Child age (T2; in months)	.93 (.85-1.02) .108
Received mental health services (T2)	.78 (.31-1.99) 0.605
Relationship satisfaction with FOB (T2)[b]	.48 (.30-.77) .002
Intervention status (HVS)	1.65 (.67-4.10) .278
Stable non-depressed group	
Depression (T1)[b]	.31 (.15-.65) .002
Mother age at birth (years)	1.01 (.75-1.35) .975

Child age (T2; in months)	.95 (.88-1.02)
	.166
Received mental health services (T2)[b]	.34 (.16-.77)
	.009
Relationship satisfaction with FOB (T2)	1.17 (.79-1.75)
	.429
Intervention status (HVS)[b]	2.56 (1.23-5.35)
	.012
	Nagelkerke R^2 = 0.390
	Chi-square = 89.37
	-2LL = 337.19***
	df = 12

Note: FOB = father of baby; HVS = Home Visiting (the intervention group); T1 = Time 1; T2 = Time 2;
OR = Odds ratio; *CI* = 95% confidence interval.
*$p < .05$. **$p < .01$. ***$p < .001$.
[a]Reference group = Depression remits at T3.
[b]Significant predictor of depression groups ($p < .05$).

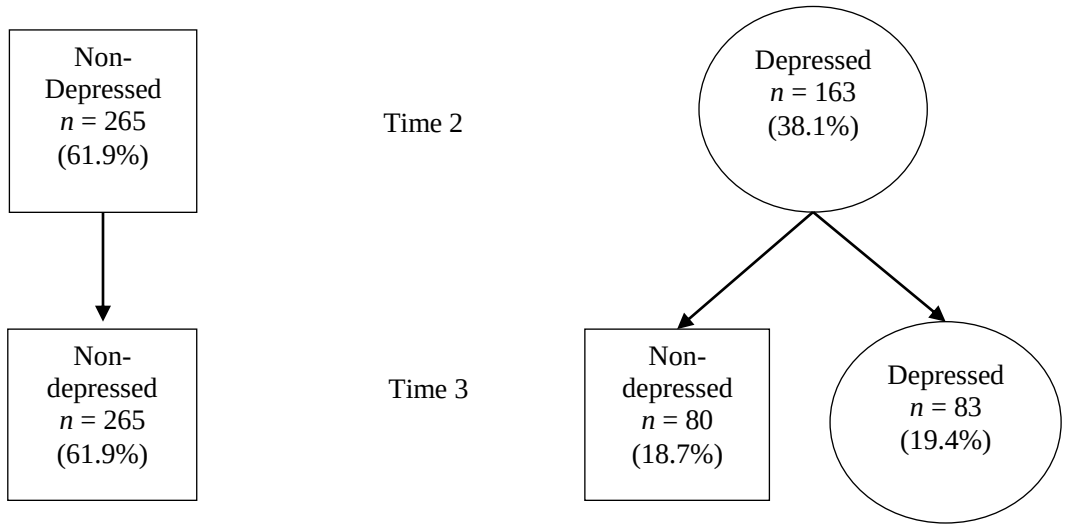

Figure 1. Maternal depression across Time 2 (1 year post-enrollment) and Time 3 (2 years post-enrollment).