

# Engaging Mothers With Depressive Symptoms in Care: Results of a Randomized Controlled Trial in Head Start

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**Objective:** The authors sought to determine whether a multicomponent, community-based program for preventing maternal depression also promotes engagement with mental health services for individuals with persistent symptoms.

**Methods:** Mothers of children enrolled in Head Start were randomly assigned between February 2011 and May 2016 to Problem-Solving Education (PSE) (N=111) or usual services (N=119) and assessed every two months for 12 months.

**Results:** Among 230 participants, 66% were Hispanic; 223 participants were included in the analysis. For all PSE participants, engagement with specialty mental health services increased from approximately 10% to 21% between two and 12 months. The PSE group was more likely than the control group to be engaged in specialty services at 12 months (adjusted odds ratio [AOR]=2.36, 95% confidence interval [CI]=1.07–5.20), and the rate of engagement with specialty services over time (treatment × time interaction)

was favored PSE ( $p=.016$ ). Among PSE participants with persistent depressive symptoms over the follow-up period, engagement with specialty services increased from 12% (two months) to approximately 46% (12 months), whereas among control group participants, engagement fluctuated between 24% and 33%, without a clear trajectory pattern. At 12 months, PSE participants with persistent symptoms were more likely to engage with specialty care compared with their counterparts in the control group (AOR=6.95, CI=1.50–32.19). The treatment × time interaction was significant for the persistently symptomatic subgroup ( $p=.029$ ) but not for the episodically symptomatic or the asymptomatic subgroups.

**Conclusions:** Embedding mental health programs in Head Start is a promising strategy to engage parents with depressive symptoms in care, especially those with persistent symptoms.

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Maternal depression disproportionately affects women with low incomes and women from racial-ethnic minority groups, and it has negative impacts on their children (1). For these women, myriad cultural, psychological, and logistic barriers impede engagement with mental health services, resulting in disparities in access to care (2). Numerous strategies have been developed to address the problem of nonengagement with mental health care (3). However, despite the role that community-based organizations play in health promotion (4), few studies have investigated whether the infrastructure of such organizations can be used to help engage depressed adults with treatment.

In 2009, the Institute of Medicine (now National Academy of Medicine) recognized that engagement with care among parents with depression is a substantial problem, and it called for interventions to be provided in community-based, family-focused venues (1). We embedded a novel intervention strategy, Problem-Solving Education (PSE), within the case management infrastructure of Head Start, a

nationwide early learning program for children from low-income families. PSE represents a multicomponent model involving screening, brief intervention, and referral to treatment (5), and it is designed to be delivered by lay, nonlicensed providers. Screening identifies an at-risk population, a brief cognitive-behavioral intervention aims to prevent the emergence or worsening of depressive symptoms, and referral to formal behavioral health services targets individuals with persistent or escalating symptoms.

We designed PSE primarily as a depression prevention intervention and, in a prior report, demonstrated its ability to reduce the rate of clinically significant episodes of depressive symptoms in a population with low symptoms at baseline (its primary aim) (6). However, prior to the study, we identified engagement with mental health services as a key secondary aim, given that many adults with subsyndromal symptoms benefit from consultation with a licensed mental health provider and because it is important that a community-based prevention strategy have a

mechanism for identifying those with persistent symptoms and referring them to a higher level of care. In our trial, we randomly assigned participants to receive PSE or usual Head Start services and measured engagement with mental health care over 12 months of follow-up. To ensure engagement with mental health care among those with persistent symptoms (i.e., those who presumably need care the most), we stratified our sample into groups by level of depressive symptomatology during the follow-up period.

## METHODS

### Design

We conducted a randomized efficacy trial in six Head Start centers in Boston. Study design details have been reported previously (6).

### Participants

From February 2011 to May 2015, we enrolled mothers whose children were expected to remain in Head Start for at least six months. We targeted those at increased risk of depression but excluded those currently experiencing a major depressive episode, as determined by the Mini-International Neuropsychiatric Interview (7). Having an increased risk of depression was defined as experiencing depressed mood or anhedonia according to the Patient Health Questionnaire–2 (8) or having a recent history of depression according to questions from the Composite International Diagnostic Interview (9). We excluded mothers with high levels of suicidal ideation according to the MacArthur Initiative on Depression and Primary Care suicide screen (10), those with a cognitive limitation according to the MacArthur Competence Assessment Tool (11), and those who were unable to communicate in English or Spanish.

### Randomization

We employed stratified, blocked randomization, using computer-generated lists to allocate participants on a 1:1 basis to PSE or usual Head Start services. Randomization occurred independently at each Head Start site, in two strata defined by whether or not the participant reported a recent history of depression, and it occurred within randomly varying blocks of two and four. Lists were concealed in opaque envelopes. Outcome assessors, investigators, and Head Start personnel were masked to study allocation.

### Study Arms

Usual Head Start services include family needs assessments, home visitation, parenting groups, referrals to behavioral health services, and assistance in accessing community resources for food, job training, and housing.

PSE includes three components: a series of six one-on-one workbook-based problem-solving sessions, depressive symptom monitoring, and linkage to formal mental health services. Problem-solving sessions last 30 to 60 minutes and are conducted over six to eight weeks, primarily as home

visits. Bachelor's-level PSE providers assess depressive symptoms with the Patient Health Questionnaire–9 (12) at every other session. Participants with moderate symptoms on two assessments, or severe symptoms on a single assessment, are referred to formal mental health services. When making referrals, PSE providers engage participants in discussions about demoralization, energy level, or stress; provide education on depression; and create patient-centered action plans to facilitate engagement with care. Consistent with principles of motivational interviewing, providers explore what is most relevant to their clients regarding symptom relief and what type of service (if any) is comfortable for them. Participants are also given the option of focusing problem-solving sessions on seeking formal mental health care for themselves, irrespective of the results of depressive symptom screening.

### Intervention Provider Training, Supervision, and Fidelity Monitoring

We trained 15 nonlicensed intervention providers in PSE and motivational interviewing. Trainees were certified as providers if they completed intervention sessions with two standardized clients and in both cases met standardized fidelity criteria (6). Provider supervision comprised weekly group meetings, facilitated by a master's-level social worker (YDL). We audiotaped one randomly selected session for each participant and applied the same standardized criteria used in provider training to assess intervention fidelity.

### Baseline Data

Depressive symptoms were measured with the Quick Inventory of Depressive Symptoms (QIDS) (13), anxiety symptoms with the Beck Anxiety Inventory (14), and trauma exposure with the stem question of the Modified PTSD Symptom Scale (15). To determine past mental health service use, we administered an adapted version of the Collaborative Psychiatric Epidemiology Survey (CPES) (16), assessing mental health care utilization over the past six months with either a primary care provider (general practitioner, family doctor, or obstetrician/gynecologist) or specialist (psychiatrist, psychologist, therapist, or social worker).

### Outcome Assessment

We followed participants for 12 months after randomization, beginning data collection after two months. To assess mental health service use over the follow-up period, we administered the CPES bimonthly, assessing utilization over the preceding two-month interval in the same primary and specialty care categories measured at baseline. For each interval, engagement with care was defined as having at least one visit.

### Analysis

To assess longitudinal trajectories of engagement with mental health services within intervention groups, we used logistic regression models based on generalized estimating

equations. We compared engagement across intervention groups by using intention-to-treat analyses. To assess engagement with care in the two-month interval prior to each follow-up time point, we used standard logistic regression and multivariable models that adjusted for baseline engagement with care. To understand the differential trajectories of engagement with services over time, we used logistic regression based on generalized estimating equations and added group  $\times$  time interaction terms to our models. In all models, we used a set of binary variables to model the effects of Head Start site, and we adjusted for whether participants had engaged with care for their mental health during the six months prior to baseline assessment. We explored provider effects by estimating regression models to determine variation in engagement with services across PSE providers, controlling for Head Start site.

To determine if the ability of PSE to promote engagement with care varied across groups of women with various levels of depressive symptomatology, we divided participants into three mutually exclusive strata based on their pattern of follow-up depressive symptoms: those with no symptomatic episodes across the six follow-up assessments (asymptomatic), those with a single episode of moderate to severe symptoms (episodic symptoms), and those with two or more episodes of moderate to severe symptoms (persistent symptoms). Depressive symptoms in the follow-up period were measured bimonthly with the QIDS. Moderate to severe symptomatology was defined as a QIDS score of 11 or greater, the most commonly used cutpoint for the instrument (13). We conducted all analyses with SAS, version 9.3.

## Sample Size

We estimated that our sample size of 230 would provide power to test a clinically significant difference in depressive symptoms across intervention arms. Although we prespecified engagement with care as a secondary outcome measure, the study was not designed specifically to detect differences in engagement.

The Boston University Medical Center Institutional Review Board approved the study.

## RESULTS

### Enrollment

Head Start caseworkers screened 2,208 mothers, and 781 met depression risk criteria. Of those, 179 were ineligible because the child was expected to leave Head Start within

**TABLE 1. Characteristics at baseline of 230 participants in the Problem-Solving Education (PSE) depression prevention program and usual Head Start Services**

Characteristic	PSE (N=111)		Usual services (N=119)	
	N	%	N	%
Demographic				
Age (M $\pm$ SD)	31.42 $\pm$ 7.08		31.30 $\pm$ 7.53	
N of children (M $\pm$ SD)	2.45 $\pm$ 1.29		2.14 $\pm$ 1.21	
Child age $\leq$ 12 months	12	11	13	11
Race				
Black	37	33	44	37
Asian	0	0	3	3
White	28	25	33	28
Other (including multiracial)	46	41	39	33
Hispanic	75	68	77	65
Education				
Less than high school (including GED)	57	52	39	33
High school degree	16	14	47	40
Some college	28	25	25	21
College degree or higher	9	8	8	7
Mental health measure				
QIDS score (M $\pm$ SD) <sup>a</sup>	8.11 $\pm$ 5.20		7.59 $\pm$ 4.38	
Beck Anxiety Inventory score (M $\pm$ SD) <sup>b</sup>	12.08 $\pm$ 10.61		12.07 $\pm$ 10.25	
Primary care visit for mental health concern within 6 months prior to baseline	20	18	14	12
Specialty mental health visit within 6 months prior to baseline	19	17	29	24
Currently takes a depression medication	14	13	19	16
Past history of major depressive episode	50	45	47	40
Ever seen a mental health professional (psychologist, therapist, or mental health social worker)	54	49	60	50
Trauma history	78	70	74	62

<sup>a</sup> QIDS, Quick Inventory of Depressive Symptoms. Possible scores range from 0 to 20, with higher scores indicating more severe symptoms.

<sup>b</sup> Possible scores range from 0 to 46, with higher scores indicating a greater level of anxiety symptoms.

six months. Of the remaining 602 mothers, 136 could not be contacted and 129 refused participation. Research staff met with 337 mothers for eligibility determination: 73 met criteria for a major depressive episode, one had suicidal ideation, and two had cognitive limitations—leaving 261 eligible participants. Nine declined to consent, and 22 were randomly selected to participate in a separate study. We enrolled 230 mothers, of whom 223 were included in the analysis. [A CONSORT diagram of the study is available as an online supplement.]

### Baseline Characteristics

Hispanic mothers constituted the majority of our sample (N=152, 66%) (Table 1); for 46% (N=106) of our sample, all study procedures were conducted in Spanish. At baseline, mean $\pm$ SD QIDS scores for depressive symptoms were closely balanced between the two groups (8.11 $\pm$ 5.20 [PSE] versus 7.59 $\pm$ 4.38 [usual services]). At baseline, 17% of PSE participants had engaged with specialty mental health care over the preceding six months, compared with 24% of participants in the usual services group; 18% had engaged with primary care-based mental health services, compared with 12% of the usual services group.

**TABLE 2. Engagement with primary care or specialty mental health care among 230 participants in the Problem-Solving Education (PSE) depression prevention program and usual Head Start services, by follow-up point<sup>a</sup>**

Type of care and follow-up point	PSE (N=105)		Usual services (N=118)		AOR	95% CI
	N	%	N	%		
Primary care						
≤6 months prior to baseline	20	18	14	12		
2 months	8	8	7	6	1.14	.39–3.30
4 months	6	6	5	4	1.19	.35–4.03
6 months	10	10	6	5	1.75	.60–5.08
8 months	5	5	6	5	.82	.23–2.88
10 months	7	7	9	8	.71	.25–2.08
12 months	8	8	10	10	.74	.27–2.05
Specialty mental health care <sup>b</sup>						
≤6 months prior to baseline	19	17	29	24		
2 months	10	10	21	18	.58	.24–1.42
4 months	9	9	21	19	.48	.21–1.07
6 months	15	15	15	13	1.52	.65–3.53
8 months	16	16	19	17	1.21	.52–2.84
10 months	21	21	15	14	2.46	1.03–5.86
12 months	21	21	15	14	2.36	1.07–5.20

<sup>a</sup> Engagement with care was defined as at least one visit during the two-month interval since the last follow-up. In all cases, the reference group was usual Head Start services. Data were missing for seven of 230 participants.

<sup>b</sup> The treatment × time interaction was significant ( $p=.016$ ).

### Intervention Delivery and Fidelity

Participants completed  $4.64 \pm 2.06$  of six possible PSE sessions, and 65 (59%) participants completed a full course of PSE. Of 54 audiotaped PSE sessions (57 mothers declined audiotaping), 28 met criteria for good model fidelity, 25 met criteria for excellent fidelity, and one audio file was damaged.

### Engagement With Mental Health Care for the Full Sample

PSE providers referred 10 mothers to formal mental health services because of high symptom scores; of these, six participants engaged with services at any time during the follow-up period. For six additional mothers, one or more PSE sessions involved engaging with mental health services; of these, three engaged with services. The number of PSE participants who engaged with specialty mental health services increased over time, from 10 (10%) at the two-month data collection point to 21 (21%) at the 12-month point. We saw no increase in engagement in service use in the usual care group (Table 2).

When we compared use of services at each follow-up time point by PSE and usual care participants in the full sample, we noted statistically significant differences by group for specialty care at the 10- and 12-month cross-sectional time points (Table 2). In a multivariable longitudinal data

analysis, the treatment × time interaction term was statistically significant for specialty service use ( $p=.016$ ), suggesting that over time, PSE participants were more likely than recipients of usual services to engage with specialty care. There was no evidence of variation in outcomes by PSE provider.

### Stratified Analysis of Engagement With Mental Health Care

Of the full cohort, 65 (29%) participants experienced persistent depressive symptoms over the follow-up period, and of those, 16 (25%) had engaged with mental health services in the six months prior to enrolling in the study. Among PSE participants with persistent depressive symptoms, engagement with specialty services increased from 12% at two months to 46% at 12 months (Table 3). Engagement with specialty services among control group participants with persistent depressive symptoms remained consistently between 24% and 31%. Among participants with persistent depressive symptoms, PSE recipients were more likely than recipients of usual services to engage with specialty care at the final (12 months) cross-sectional follow-up time point (adjusted odds ratio [AOR]=6.95). In a multivariable longitudinal data analysis, the treatment × time interaction term was statistically significant for specialty service use ( $p=.029$ ) among participants with persistent depressive symptoms, suggesting that over time, PSE increased the likelihood that participants with persistent depressive symptoms would engage with specialty care.

Cross-sectional differences in engagement with specialty services by the asymptomatic subgroup were apparent at the final assessment of the follow-up period (AOR=4.56) and at 10 months (AOR=7.72). However, the treatment × time interaction term was not significant for this group, suggesting no trend over time. No significant trends, either cross-sectional or longitudinal, were evident for the subgroup with episodic depression. There was no evidence of variation in engagement by PSE provider for any depression-severity subgroup. No significant trends were observed within depression severity subgroups for engagement with primary care-based services.

### DISCUSSION

PSE is multicomponent, lay-delivered intervention that focuses on preventing depression. In addition to its prevention centerpiece, PSE involves depressive symptom monitoring and referrals to formal mental health services when necessary. Referrals are facilitated either by devoting problem-solving sessions to this purpose or by intervention providers using evidence-based motivational techniques to discuss the possibility of their clients' engaging with formal care (17). Over the course of a full calendar year, in addition to preventing a worsening of depressive symptoms (as communicated in a previous publication [6]), PSE appeared to increase the likelihood of engagement with specialty mental health services. This increased engagement occurred only

among women whose depressive symptoms were persistent over the follow-up period, suggesting that participants who needed a higher level of care received it.

Despite a higher incidence of depression among mothers with a low income and those from racial-ethnic minority groups (18), disparities exist in access to, and engagement with, mental health care (2). Numerous strategies have been developed to address the problem of engagement with mental health care, but such strategies to date have focused on bridging services within traditional medical venues rather than across service sectors, such as with Head Start preschool programs. Furthermore, although it is known that individuals of Latina background face particular challenges with engaging in mental health services (19,20), these women have been relatively understudied as a specific subpopulation. Our study adds to the extant literature by demonstrating the ability of a lay-delivered intervention, embedded in a child-focused preschool setting, to engage low-income mothers—two-thirds of whom were Latina—with depression care.

Our study had limitations. First, our analysis included engagement with care as an outcome measure and depressive symptomatology as a stratification variable. Although a stratified analysis was necessary to determine whether engagement with care occurred among those with the highest level of symptoms (i.e., those presumably most in need of formal care), one would also expect that engaging with mental health services would lead to symptom improvement, thereby complicating the relationship between engagement with care and depressive symptoms. This relationship between engagement and symptoms is further complicated by the time it typically takes to experience relief from depression symptoms following the initiation of treatment, the variability in quality of community mental health services (21), and the relatively small size of the subgroup with persistent symptoms. Each of these complexities is unlikely to be accounted for completely in our statistical models.

Second, the ability of our participants to access mental health resources depends on many factors, including local availability of resources and willingness of insurance carriers to pay for them. In our state, compared with others, mental health resources are more plentiful and Medicaid policies are relatively generous. Third, although we used validated instruments to assess engagement with care, we relied on self-report and did not reliably measure retention in care. Last, although PSE providers and Head Start caseworkers had similar cultural backgrounds and no formal mental health training, the providers were paid study personnel. Our study design, therefore, represented an efficacy approach. In this efficacy context, we were unable to firmly establish model fidelity because half the sample declined to be audio-taped. Further work, therefore, is necessary to demonstrate the effectiveness of this strategy and to determine optimal implementation strategies.

**TABLE 3. Engagement with primary care or specialty mental health care among 230 participants in the Problem-Solving Education (PSE) depression prevention program and usual Head Start services, by follow-up point and depression severity subgroup<sup>a</sup>**

Follow-up point	PSE		Usual services		AOR	95% CI
	N	%	N	%		
Persistent subgroup (N=65) <sup>b</sup>						
Total	25		40			
≤6 months prior to baseline <sup>c</sup>	3	12	13	33		
2 months	3	12	12	30	.51	.11–2.35
4 months	2	9	11	28	.32	.07–1.48
6 months	8	33	10	25	3.44	.73–16.32
8 months	8	35	12	31	2.35	.52–10.60
10 months	12	48	11	30	5.58	1.18–26.45
12 months	11	46	9	24	6.95	1.50–32.19
Episodic subgroup (N=32) <sup>d</sup>						
Total	17		15			
≤6 months prior to baseline <sup>c</sup>	4	24	4	27		
2 months	2	13	3	21	.53	.07–4.04
4 months	2	12	1	7	1.71	.15–19.60
6 months	3	18	1	8	2.64	.28–24.92
8 months	2	13	2	15	.97	.11–8.68
10 months	2	14	2	15	1.03	.10–11.04
12 months	3	20	3	23	.87	.15–5.06
Asymptomatic subgroup (N=126)						
Total	63		63			
≤6 months prior to baseline <sup>c</sup>	10	16	12	19		
2 months	5	8	6	10	1.21	.26–5.61
4 months	5	8	9	15	.58	.19–1.81
6 months	4	7	4	7	1.46	.28–7.57
8 months	6	10	5	8	1.89	.42–8.63
10 months	7	12	2	3	7.72	1.51–39.38
12 months	7	11	3	5	4.56	1.18–17.66

<sup>a</sup> Engagement with care during the follow-up period was defined as at least one visit during the two-month interval since the last follow-up. In all cases, the reference group was usual Head Start services. Depression severity subgroups included those with no symptomatic episodes across the six follow-up assessments (asymptomatic), those with a single episode of moderate to severe symptoms (episodic), and those with two or more episodes of moderate to severe symptoms (persistent). Data were missing for seven of 230 participants.

<sup>b</sup> The treatment × time interaction was significant ( $p=.029$ ).

<sup>c</sup> Includes only participants who contributed follow-up data.

<sup>d</sup> Site was excluded from the model because of small sample size.

## CONCLUSIONS

Limitations notwithstanding, this study indicates that PSE is likely to be efficacious in promoting engagement with specialty care, and it appears to do so for a population with persistent depressive symptoms and in a manner consistent with its underlying theoretical model. Embedding mental health programs in Head Start, therefore, appears to be a promising strategy to prevent depression among young mothers and to help those with persistent symptoms to engage in care. More work is needed to demonstrate the model's effectiveness and potential for implementation.

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