

Enrolling and Retaining Mothers of Substance-Exposed Infants in Drug Abuse Treatment

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This study provided an experimental test of a drug abuse treatment enrollment and retention intervention in a sample of 103 Black mothers of substance-exposed infants. Significantly more women assigned to the Engaging Moms Program enrolled into drug abuse treatment than did women assigned to the control condition (88% vs. 46%). Sixty-seven percent of participants in the Engaging Moms Program received at least 4 weeks of drug abuse treatment compared with 38% of the control women. However, there were no differences between the groups 90 days following treatment entry. Logistic regressions revealed that readiness for treatment predicted both short-term and long-term treatment retention. The Engaging Moms Program has considerable promise in facilitating treatment entry and short-term retention, but it did not influence long-term retention.

Drug abuse among women is a complex, expensive, and damaging health care problem (Andres, 1996; Hoffman et al., 1996). The number of women using drugs has increased dramatically during the last 15 years, especially among women of childbearing age (Chasnoff, Landress, & Barrett, 1990; Day, Cottreau, & Richardson, 1993; Kandel, Warner, & Kessler, 1998; Substance Abuse and Mental Health Services Administration, 2001). It is estimated that 7 million women meet criteria for lifetime drug dependence or abuse (Kandel et al., 1998). The adverse consequences of drug abuse among women are numerous and far-reaching (Blumenthal, 1998; Grella, 1996; Haller, Knisely, Dawson, & Schnoll, 1993; Magura & Laudet, 1996; Pajer, 1998). Women drug users are at high risk of becoming HIV infected and developing AIDS, being victims of abuse and crime (Dansky, Byrne, & Brady, 1999; Tardiff et al., 1994), and delivering substance-exposed newborns who themselves are at risk of im-

paired physical and behavioral development (Chasnoff, Burns, Schnoll, & Burns, 1985; Chavkin, Wise, & Elman, 1998; Horgan, Rosenback, Ostby, & Butrica, 1991; Singer et al., 2002). In contrast to the increase in prevalence, the number of women served by drug abuse treatment has risen only slightly, as they tend to underuse substance abuse treatment resources (Gfroerer, 1995; Weisdorf, Parran, Graham, & Snyder, 1999).

For women as well as men, drug abuse treatment, in comparison with other psychiatric or behavioral treatments, is noted for low retention rates (Battjes, Onken, & Delaney, 1999; Festinger, Lamb, Kountz, Kirby, & Marlowe, 1995; Hser, Maglione, Polinsky, & Anglin, 1998). As Crits-Christoph and Siqueland (1996) summarize, "High dropout rates are apparent even in our sample of relatively recent studies, in which researchers have attempted to provide high quality therapy using treatment guides or manuals" (p. 753). Moreover, studies indicate even higher treatment refusal and dropout rates among drug abusers referred but not yet enrolled in treatment (Booth, Crowley, & Zhang, 1996; Festinger et al., 1995; Gottheil, Sterling, & Weinstein, 1997; Rounsaville & Kleber, 1985; Stranz & Welch, 1995).

The poor record of drug abuse treatment enrollment and retention coupled with the well-established relationship between length of time in treatment and outcome (De Leon, 1985; Grella, Joshi, & Hser, 2000; Howell et al., 2000; Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997; Simpson, 1981) has led to an increased focus on (a) investigating the process of drug abuse treatment enrollment and retention and (b) designing interventions to enhance enrollment and retention (e.g., Garrett, Landau-Stanton, Stanton, Stellato-Kabat, & Stellato-Kabat, 1997; Hser et al., 1998; Joe, Simpson, & Broome, 1999; Lovejoy et al., 1995; Simpson, Joe, Rowan-Szal, & Greener, 1997). With problem drinkers and their families, motivational interventions designed to improve treatment retention have shown considerable efficacy (e.g., Bien,

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Miller, & Boroughs, 1993; W. R. Miller, Meyers, & Tonigan, 1999). For adult drug users, the results have been equivocal. With a few notable exceptions (e.g., He et al., 1996; Saunders, Wilkinson, & Phillips, 1995; Simpson et al., 1997), specialized interventions aimed at improving treatment enrollment and retention rates have not been significantly more effective than standard care (e.g., Alterman, Bedrick, Howden, & Maany, 1994; Donovan, Rosengren, Downey, Cox, & Sloan, 2001; Stark, Campbell, & Brinkerhoff, 1990).

Although race, severity of drug abuse, and prior drug abuse treatment have been shown to be associated with drug abuse treatment enrollment and retention (Booth et al., 1996; Gaine, Wells, Hawkins, & Catalano, 1993; Sigueland et al., 1998), motivation stands out as perhaps the most important contributing factor. There is considerable evidence that drug users initially coerced into treatment by their families, employers, or the legal system do as well in treatment as those who enter voluntarily (e.g., Brecht, Anglin, & Wang, 1993; Hser et al., 1998; N. S. Miller & Flaherty, 2000; Nishimoto & Roberts, 2001; Rounsaville & Kleber, 1985). However, many studies in this area did not explicitly distinguish between or adequately measure and analyze both extrinsic and intrinsic motivation, making it difficult to determine the extent to which the relatively good outcomes associated with coerced treatment were influenced by intrinsic motivation. Studies that have measured both types of motivation suggest that intrinsic motivation, with or without coercion, is fundamental to treatment enrollment and retention and, ultimately, to the recovery process (Broome, Knight, Knight, Hiller, & Simpson, 1997; Cunningham, Sobell, Sobell, & Gaskin, 1994; Farabee, Prendergast, & Anglin, 1998; Joe, Simpson, & Broome, 1998). A recent analysis of a national study of 18 residential facilities found that both extrinsic and intrinsic motivation were independently related to treatment retention. The clients who were most likely to stay in treatment showed high levels of both types of motivation (Knight, Hiller, Broome, & Simpson, 2000). Although much still is not known about how extrinsic and intrinsic motivation influence enrollment, retention, and outcome, there is an emerging consensus that increasing drug abuse treatment enrollment and retention rates will require the development of new interventions.

The current study was designed to address this need in a group of cocaine-abusing mothers. This group was chosen because of their notably low treatment enrollment and retention rates and because the consequences of their drug use are serious and extend beyond themselves to their children. Hence, it is a group much in need of services. The intervention we developed, called the Engaging Moms (EM) Program, was compared with standard community services used for enrolling and retaining cocaine-involved mothers in treatment. This program is rooted in (a) the relational model of women's development (Dakof, 2000; J. B. Miller, 1976; Jordan, 1991; Stiver, 1991; Surrey, 1991), (b) family therapy models of treating drug abuse (Liddle, Dakof, & Diamond, 1991; Stanton, Todd, & Associates, 1982; Szapocznik & Kurtines, 1989), and (c) family preservation models of service delivery (Wells, 1995; Wells & Biegel, 1991).

The EM Program is a manualized, in-home approach that intervenes at the level of the individual and family (Quille & Dakof, 1999). It is not a treatment for drug abuse but rather an intervention designed to facilitate enrollment and retention in drug abuse treatment. Although not drug treatment per se, its sessions are decid-

edly therapeutic in nature. The EM intervention seeks to change women through their interpersonal relationships with the EM specialist (counselor) as well as the family. Building and maintaining an authentic relationship with the mother is the key organizing principle of the EM Program. Every intervention is either designed to establish and strengthen the counselor-client relationship or stems from it.

The program consists of two phases (enrollment and retention). During the enrollment phase, the EM specialist is single-mindedly focused on one goal: enrolling the mother in treatment. He or she is not focused on issues that might be necessary to address in treatment and recovery, such as taking personal responsibility for one's behavior. To achieve the objectives of the enrollment phase, the EM specialist conducts individual and joint sessions with the mother and her family. With the mother, instead of emphasizing responsibility and freedom of choice, we assume that untreated cocaine-abusing women are unable to take responsibility for themselves or their treatment. Therefore, the EM specialist, not the mother, initially takes responsibility for the mother's entry into treatment. Within an interpersonal context of respect, compassion, warmth, and admiration, key aspects of working with the mother include the following: (a) validating the mother's feelings and experiences about delivering a substance-exposed baby; (b) conducting a detailed life review highlighting losses and missed opportunities as well as competencies and strengths; (c) helping the mother understand her life situation as a stage that was unavoidable given her extremely difficult life circumstances; (d) instilling hope in the mother about the possibility for positive change and a better life; and (e) strengthening the bonds between the mother and her family of origin, partner (if any), and children. Additionally, the specialist attempts to address immediate barriers to treatment enrollment and retention such as obtaining birth certificates and social security numbers for mother and newborn, financial and transportation assistance, medical care, and services to help family members care for the children while the mother is participating in treatment.

The EM Program also works directly with the mother's family. A family genogram is constructed to identify family members who are most able to help the mother enroll and remain in treatment. The specialist meets with family members to solicit their assistance in helping the mother enter drug abuse treatment. Key interventions aimed at meeting this objective include the following: (a) encouraging family members to tell their stories about the mother and her drug use history, sympathizing with their plight, and complimenting them on their past efforts to help the mother; (b) persuading the family to once again help the mother enroll in treatment with assurances of close collaboration from the EM Program; (c) restraining negativity and pessimism; and (d) encouraging the family to provide practical and emotional assistance to help the mother enroll in treatment.

During the retention phase, once the woman enters treatment, the EM specialist continues to provide individual and family sessions during the first 4 weeks of treatment. The issues addressed during the enrollment phase remain a focus and are elaborated during the retention phase. Additional work during this phase involves helping the mother adjust to treatment by immediately attending to potential problems such as interpersonal difficulties with other clients or staff, adjusting to the rules of the treatment program, and addressing family and other interpersonal pressures.

The goal is for the mother to be bonded to treatment program staff to ensure a smooth transition from the EM Program to the drug abuse treatment program.

It was hypothesized that significantly more mothers in the experimental condition, the EM Program, in comparison to mothers in the control condition, community services as usual, would (a) enroll in drug abuse treatment and (b) complete the first 4 weeks of treatment. The influence of the EM Program on 90-day retention also was examined.

Method

Participants

To be eligible for this study, participants had to meet the following criteria: (a) Black, (b) female, (c) at least 18 years old, and (d) toxicology screen on mother or infant positive for cocaine. The sample was limited to one racial group because the anticipated sample size of approximately 100 participants would not provide sufficient statistical power to fully analyze racial differences. Black women were chosen as the focus because of data suggesting that they are overrepresented in samples of substance-abusing mothers reported to state authorities for investigation of possible child abuse and neglect and referred by child welfare agencies to drug abuse treatment (Chasnoff et al., 1990; Sagatun-Edwards & Saylor, 2000; Sagatun-Edwards, Saylor & Shifflett, 1995). Referrals to the study were made either from University of Miami/Jackson Memorial Hospital shortly after childbirth or from the Department of Children and Families after a child abuse/neglect report had been made to that agency.

One hundred thirty Black women were referred to the study. One hundred three were recruited into the study, yielding a 79% (103/130) response rate. Reasons for nonparticipation ($n = 27$) were as follow: could not locate the woman following the initial referral ($n = 16$), in treatment at the time of the referral ($n = 6$), or refused to participate in the study ($n = 5$). Although 95% of the sample was African American, the final sample included 5 non-African American Blacks: 3 Haitian, 1 Jamaican, and 1 Bahamian.

Women were recruited into the study and randomly assigned to either the EM Program ($n = 51$) or community services as usual ($n = 52$). To determine whether the groups were equivalent at baseline, we conducted one-way analyses of variance (ANOVAs) for the continuous variables of age, education, income, number of children, and number of previous drug abuse treatment experiences. Chi-square tests were used for the categorical variables of HIV status, cocaine-dependence diagnosis, marital status, extent of child welfare sanctions, and treatment modality at referral. There were no differences at the .05 level between the two groups on any of these variables at baseline. As can be seen in Table 1, the mothers who participated in this study were primarily low-income, uneducated, single parents, with several children.

Procedures

After initial eligibility was established, research staff visited potential participants in their homes to explain the study procedures and purpose, including the randomization procedure, and to obtain written informed consent. It was emphasized that participation was voluntary and that the women had the right to discontinue participation at any time. Next, a research assessment, again administered in the home, was completed by

Table 1
Baseline Participant Characteristics for Each Engagement Group

Characteristic	Engaging Moms		Services as usual	
	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	<i>n</i> (%)	<i>M</i> (<i>SD</i>)
Age, in years		31.2 (5.5)		30.2 (4.1)
Education, in years		11.18 (1.7)		10.81 (1.2)
Monthly income, \$		541 (480)		608 (594)
HIV positive	6 (12)		7 (13)	
No. of children		4.6 (2.6)		4.1 (3.0)
Extent of Child Welfare Department involvement				
None	4 (8)		4 (8)	
Minimal	24 (47)		31 (60)	
Moderate	14 (27)		10 (19)	
Extensive	9 (18)		7 (13)	
Treatment modality at referral				
Outpatient	20 (39)		17 (33)	
Day treatment	19 (38)		23 (44)	
Residential	12 (23)		12 (23)	
Cocaine dependent	32 (63)		27 (52)	
Cocaine abuse	51 (100)		52 (100)	
Times treated for drug addiction				
Never	20 (39)		22 (42)	
Once	8 (16)		9 (17)	
Twice	10 (20)		6 (12)	
More than twice	13 (25)		15 (29)	
Marital status				
Never married, not living with partner	27 (53)		32 (62)	
Married, living with partner	2 (4)		2 (4)	
Living with partner, not married	14 (27)		11 (21)	
Separated, divorced, or widowed	8 (16)		7 (13)	

Note. There were no missing data on any of the variables reported. Fifty-one participants are in the Engaging Moms Program group and 52 are in the control group.

research staff who received 15 hr of initial training and additional ongoing supervision to standardize data collection procedures and minimize circumstances that might threaten the validity of the data (e.g., client resistance, reading problems). Participants were paid \$35 for completing this assessment.

Randomization

After the assessment, participants were randomly assigned to either the EM Program or to community services as usual. To ensure a balanced distribution between the two groups on pretreatment characteristics that prior research suggests might be related to engagement and retention, we used an urn randomization procedure (Stout, Wirtz, Carbonari, & Del Boca, 1994). Variables entered into the urn were (a) modality of drug abuse treatment to which the woman was referred (long-term residential, day treatment, or outpatient), (b) age, (c) HIV status (positive or negative), and (d) extent of state child welfare system sanctions (none, minimal, moderate, or extensive).

Intervention Groups

All study participants had been reported to the state Child Welfare Department for investigation of possible child abuse or neglect. That investigation included a psychosocial evaluation and treatment referral conducted by Miami-Dade County Department of Rehabilitation Services. It is important to recognize that the specific treatment referral was made by the county program and not by the research project. Referral to a particular drug abuse treatment program and assignment to the study conditions were independent. The county program determined which modality was most appropriate (outpatient, day treatment, or residential) and then referred women to a specific treatment program within the selected modality. Selection of treatment program was based on (a) availability, (b) client preference, and (c) proximity to the women's home. Treatment referral and study recruitment occurred within the same week.

Community services as usual. As no standard of care or best practices are available concerning enrollment and retention in drug abuse treatment for this population, the actual practices used in this community served as the control condition. No restrictions were placed on participants' receipt of services from other sources. Women in the control condition received, at minimum, (a) an in-home psychosocial evaluation, (b) a referral to a drug treatment program, (c) a follow-up phone call within a day of the scheduled initial treatment appointment, and (d) whatever enrollment and retention interventions were provided by the drug treatment program to which they were referred.

EM Program intervention. The EM Program is a manualized, time-limited, phased (8 weeks for enrollment into treatment and 4 weeks to promote retention into treatment) goal-oriented engagement intervention. If the EM specialist could not enroll the mother in treatment by 8 weeks after baseline, then the mother received no further services from the EM Program. Intervention specialists had caseloads of 8 women each, and they provided 24-hr-a-day case coverage to be able to work efficiently and to handle any crises that might emerge (e.g., domestic violence, suicidal impulses). Intervention contacts typically included between one and four individual, family, or case management sessions per week of varying lengths (from 20 min to 2 hr). Depending on the demands and phase of the program (enrollment or retention), clinical contacts occurred as frequently as every day or as infrequently as once per week. Sessions usually took place in the mother's home, although contacts also took place in other settings such as a courtroom lobby, a treatment program, a park, or in the engagement specialist's office.

EM specialists. Five Black women (2 African American, 1 Haitian American, and 2 Jamaican American) delivered the EM Program. They ranged in age from 34 to 52 years ($M = 41.6$). Three of the specialists had master's degrees with 4 to 6 years of prior drug abuse treatment experience,

one had a bachelor's degree with 6 years of prior drug abuse treatment experience, and one was a psychiatric resident with 6 years prior drug abuse treatment experience. Although in this study only Black women delivered the EM Intervention, we do not believe that Black women must deliver the program. It just so happened that these five Black women were the most qualified job candidates. Factors such as gender, race, ethnicity, and even level of education were less important to us in selecting EM specialists than were the following requirements: (a) knowledge and understanding of the lifestyles of female addicts, (b) comfort working in close emotional proximity with addicts, (c) capacity for warmth and compassion, and (d) belief in possibility for change and basic optimism toward humanity. Each specialist received 20 hr of didactic training including detailed manual review, treated one practice case under close supervision, and observed training videotapes and live EM sessions. After the initial training, specialists met with supervisors weekly to review intervention practices and solve any clinical challenges. Chi-square tests were used to examine whether specialist effects were present for the three dependent variables of treatment enrollment, 4-week, and 90-day retention. No EM specialist effects were observed for treatment enrollment, $\chi^2(4, N = 51) = 3.13, p = .54$; 4-week retention, $\chi^2(4, N = 51) = 3.85, p = .43$; and 90-day retention, $\chi^2(4, N = 51) = 2.24, p = .69$.

Treatment fidelity. Adherence to the EM Program parameters and techniques was evaluated. Intervention parameters are the general characteristics of an intervention that determine the timing, intensity, duration, and targets of the intervention (Clarke, 1995). The following parameters were measured on all 51 cases assigned to the EM Program condition: number of sessions with the mother, number of sessions with the family, number of case management interventions, number of contacts with the treatment program, and number of contacts with the state Child Welfare Department. Inspection of the means revealed the following average per case treatment parameters recorded from every case assigned to the EM Program condition ($n = 51$): 8.1 ($SD = 4.5$) individual sessions with the mother, 2.7 ($SD = 2.8$) family sessions, 3.5 ($SD = 2.7$) case management sessions, 4.3 ($SD = 4.1$) contacts with treatment program staff, and 1.4 ($SD = 1.7$) contacts with the state Child Welfare Department per case.

To measure adherence to the EM therapeutic techniques, we created two 11-item adherence process-coding measures, one for interventions directed toward the mother and the other for interventions directed toward the family. Each instrument included both prescribed and proscribed core techniques of the EM Program. Four research assistants, all Black women, ranging in age from 20 to 53 years ($M = 27$) and trained by Gayle A. Dakof to recognize intervention techniques, coded 150 randomly selected audio or videotaped intervention sessions in their entirety. Coding was done by pairs of coders, each working independently. Intraclass reliabilities for the mother scales ranged from .73 to .93, with an average interrater reliability of .84, and from .54 to .91 for the family scale with an average interrater reliability of .74.

To evaluate adherence, we did one-sample t tests on the 7-point scales used to rate the extent to which a given intervention was observed in the session. On the mother scale, all prescribed items were significantly higher and all proscribed items were significantly lower than the test value of 4.00, indicating excellent model adherence. The prescribed items in order of descriptiveness are as follow: (a) "expresses warmth, compassion, and respect toward mother" ($M = 6.26, SD = 1.02$), (b) "actively attempts to engage mother in a collaborative effort" ($M = 6.00, SD = 1.31$), (c) "encourages mother to experience and express affect in sessions" ($M = 5.63, SD = 1.29$), (d) "supports mother's attachment to baby and other children" ($M = 4.49, SD = 1.77$), (e) "instills hope" ($M = 4.48, SD = 1.17$), (f) "searches for and enlarges upon mother's strengths and positive qualities" ($M = 4.46, SD = 1.68$), and (g) "encourages mother to talk about drug use and its consequences" ($M = 4.0, SD = 1.96$). Proscribed items are as follow: (a) "utilizes behavior intervention techniques such as relaxation training, problem solving or communication skills" ($M = 1.08, SD = .44$), (b) "emphasizes mother's responsibility and

freedom of choice concerning entering a drug abuse treatment program" ($M = 1.12, SD = .49$), (c) "educates mother about addiction or codependency" ($M = 1.17, SD = .77$), and (d) "emphasizes abstinence by giving mother a rationale for abstinence" ($M = 1.90, SD = 1.29$). On the family scale, all but two items ("instills hope" and "supports family attachment to children") were significantly higher or lower than the test value of 4.00. The proscribed items are: (a) "actively attempts to engage the family in a collaborative effort" ($M = 6.04, SD = 1.22$), (b) "expresses warmth, compassion, and respect toward the family" ($M = 5.88, SD = 1.61$), (c) "helps family to support mother's efforts to enroll and engage in drug treatment" ($M = 5.23, SD = 1.52$), (d) "encourages family to express affect in sessions" ($M = 4.54, SD = 1.92$), (e) "supports family's attachment to baby and mother's other children" ($M = 4.38, SD = 1.77$), (f) "instills hope" ($M = 3.74, SD = 1.86$), and (g) "helps family to restrain their negativity" ($M = 2.12, SD = 1.73$). Proscribed items are as follow: (a) "encourages family to discuss how important mother is to them and the ways in which she has become a problem" ($M = 2.73, SD = 2.06$), (b) "directly addresses drug use among mother's family" ($M = 1.64, SD = 1.56$), (c) "educates family about addiction or codependency" ($M = 1.35, SD = 1.41$), and (d) "encourages family to directly confront mother about her continued drug use" ($M = 1.27, SD = 0.84$).

Measures

Background information. The Addiction Severity Index (ASI; McLellan et al., 1992), a widely used clinical research instrument designed to assess problems associated with substance abuse, was administered to the mothers at intake. Individual items were used to gather basic demographic, psychosocial, and treatment background information.

Drug use. The composite score of the drug use scale from the ASI was used to measure severity of the drug use problem over the 30 days prior to baseline. The Structured Clinical Interview for *DSM-IV* (First, Spitzer, Gibbon, & Williams, 1996), a semistructured interview designed to assess major Axis I disorders, was used to establish the diagnosis of cocaine abuse or dependence at baseline.

Modality of referred treatment. As mentioned in the *Procedure* section, a county program, separate from the research enterprise, determined which drug abuse treatment modality and specific program was most appropriate for each woman. Women were referred to outpatient, day treatment, or residential treatment. With participants' written permission, information about treatment referrals was gathered directly from the county program and confirmed with each participant.

Extrinsic motivation. Information about extent of child welfare sanctions was gathered directly from the State of Florida Department of Children and Families (DCF) as an indicator of extrinsic motivation. The extensiveness of child welfare sanctions was used as a measure of extrinsic motivation for treatment in that the greater the sanctions, the more the mother had to lose from her continued drug abuse. Extent of sanctions was assessed by DCF on a 4-point scale, in which 1 = *mother retains custody of child, no court involvement, case closed*; 2 = *mother retains custody of child, no court involvement, case remains open with the Child Welfare Department for periodic monitoring*; 3 = *mother retains custody of child, court involvement, intensive supervision by Child Welfare Department*, and 4 = *mother does not have custody of child, court involvement, intensive supervision by child welfare*. The mothers assigned a score of 3 or 4 on this scale had cases in dependency court and were at risk of having their parental rights terminated.

Intrinsic motivation. The Motivation and Readiness subscales from the Circumstances, Motivation, Readiness and Suitability Scales (CMRS; De Leon, Melnick, Kressel, & Jainchill, 1994) were used as indicators of internal motivation for treatment. The Motivation subscale assesses inner reasons for change, such as fears about health or a positive drive for a better life. The Readiness subscale assesses a person's perceived need for treatment as a vehicle for change, as opposed to other self-change options (e.g., personal will power, moving to a new city, help from friends or religion).

The CMRS has been shown to have adequate internal consistency and predictive validity (Melnick, DeLeon, Hawke, Jainchill, & Kressel, 1997).

Enrollment and retention into treatment. Information on whether the mother enrolled in drug abuse treatment and her attendance in treatment for up to 90 days was gathered directly from the various treatment programs and confirmed by the county agency that made the treatment referrals and monitors attendance. Different treatment programs required different amounts of participation. For example, outpatient services were provided 2 to 3 days per week, day treatment required participation 5 days per week, and residential treatment required 7 days per week, 24 hr per day participation. For purposes of this study, weekly attendance was calculated relative to each program's requirements. Thus, for a woman in day treatment to be counted as attending for a given week, she had to attend all 5 days. Similarly, a woman in outpatient treatment had to attend the 3 required days, and a woman in residential treatment had to remain in it for all 7 days. The only exception to this rule was an excused absence from the treatment program (e.g., medical appointment, court appearances, vocational training).

Results

Enrollment and Retention Analyses

This study used the conservative intent-to-treat design that includes in the analyses all randomized participants.

Hypothesis 1 predicted that more mothers in the specialized EM Program would enter drug treatment than women in the control condition. The results presented in Table 2 show that this hypothesis was confirmed. More women assigned to the EM Program entered treatment than did women assigned to the control condition, $\chi^2(1, N = 103) = 20.62, p = .000$. Eighty-eight percent of women in the EM Program enrolled in a drug treatment program compared with 46% of the women in the control condition. Only 6 women in the EM Program did not begin treatment.

Hypothesis 2 predicted, on the basis of continuing involvement with the EM Program during the first 4 weeks past drug treatment entry, that mothers in the EM Program would be significantly more likely to receive at least 4 weeks of drug abuse treatment than women in the control condition. As shown in Table 3, this hypothesis was also supported, $\chi^2(1, N = 103) = 8.12, p = .004$, with 66.7% of the women assigned to the experimental condition remaining in treatment for at least 4 weeks compared with 38.5% of the women assigned to the control condition.

Although there was no expectation that participation in the EM Program would influence longer term retention, we conducted post hoc analyses to examine whether women assigned to the EM Program would remain in treatment longer than women assigned to the control condition. Data on length of treatment were collected for 3 months (90 days). A Kaplan-Meier survival analysis revealed that once women entered drug treatment, attrition from drug treatment was unrelated to assigned study condition: Both experimental

Table 2
Enrollment in Drug Abuse Treatment

Group	Enrolled in treatment <i>n</i> (%)	Not enrolled in treatment <i>n</i> (%)	Total
Engaging Moms Program	45 (88)	6 (12)	51
Usual community services	24 (46)	28 (54)	52

Table 3
Four-Week Retention in Drug Abuse Treatment

Group	Retained n (%)	Not retained n (%)	Total
Engaging Moms Program	34 (67)	17 (33)	51
Usual community services	20 (38)	32 (62)	52

and control conditions had similar attrition rates, log rank test (1) = 1.05, $p = .31$. Among women who entered treatment, there were virtually no differences in 90-day retention, with only 20 women assigned to the EM Program and 18 women assigned to community services as usual staying in treatment for at least 90 days.

Finally, logistic regression analyses were done on the three outcome variables of treatment enrollment (yes vs. no), 4-week retention (yes vs. no), and 90-day retention (yes vs. no) to investigate whether variables other than intervention group influenced outcome. Previous research and theory suggest that baseline intrinsic and extrinsic motivation, severity of drug use, and treatment experiences are potentially important predictors of treatment enrollment or retention for drug using mothers. For that reason, these variables were selected as the covariates for a series of stepwise logistic regressions. The covariates were entered in three blocks. In the first block, the motivation variables of extent of child welfare system sanctions and the Motivation and Readiness subscales of the CMRS were entered. In the second block, substance abuse and treatment characteristics of drug use severity as measured by the ASI, number of prior treatment experiences, and modality of treatment referral (residential, day, or outpatient) were entered. In the third block, study intervention condition (EM Program or community services as usual) was entered. Intervention condition was entered last to determine whether it still predicted treatment entry after accounting for the variance of the prior covariates. A total of 101 clients (98%) had complete data for these logistic regressions.

In these analyses, as expected, intervention condition remained the only significant predictor of entry into treatment, Wald $\chi^2(1, N = 100) = 16.61, p < .001$; odds ratio (OR) = 8.25, and a significant predictor of retention in treatment at 4 weeks, Wald $\chi^2(1, N = 100) = 7.08, p < .008$; OR = 0.33. It was not a significant predictor of retention in treatment to 90 days. Of the covariates, only CMRS readiness to enter treatment was a significant predictor of retention in treatment to 4 weeks, Wald $\chi^2(1, N = 100) = 3.69, p = .05$; OR = 0.31, and retention in treatment to 90 days, Wald $\chi^2(1, N = 100) = 6.20, p = .013$; OR = 3.13; such that those who scored higher in readiness prior to randomization were more likely to remain in treatment at 4 weeks and 90 days.

Finally, using logistic regression, we examined within the EM Program intervention group whether dose of intervention (total contact hours) influenced treatment entry, 4-week retention, or 90-day retention. Dosage was unrelated to each of these variables.

Discussion

The results demonstrated that the EM Program was significantly more effective than usual community services in fostering drug

abuse treatment enrollment by drug-abusing mothers of substance-exposed infants. Eighty-eight percent of the women assigned to the EM Program entered drug treatment compared with 46% of the women in the control condition. Moreover, results of a logistic regression indicated that this effect could be attributed to the intervention and not to other factors such as baseline motivation, severity of drug use, number of previous treatment experiences, or modality of drug abuse treatment referral. Also, the EM Program appears to have had a significant impact on short-term retention. Specifically, 67% of the women in the EM Program received at least 4 weeks of drug abuse treatment compared with 38% of the control women. Yet, a relatively small number of women in each group remained in treatment for 90 days (39% assigned to EM Program and 35% assigned to community services as usual stayed in treatment for at least 90 days). Additionally, results from the logistic regressions indicate that readiness for treatment at baseline, a measure of intrinsic motivation, is a critical factor in treatment retention.

The primary results of this study are very similar to another attempt to encourage adult drug abusers to participate in treatment. He et al. (1996) evaluated the effects of a treatment engagement intervention on injection drug users and found, similar to our results, that the intervention successfully facilitated treatment entry. Once the engagement intervention terminated, however, about a month after treatment entry, there were no differences in retention between the experimental and control conditions. Although they targeted different drug-abusing populations, the results from these two studies suggest that interventions can be designed to increase drug abusers' enrollment in treatment, and in the case of the EM Program, we were able to maintain retention as long as the intervention lasted. However, in neither intervention did retention results last much beyond the end of the intervention.

The present study points to several possibilities for intervention development. First, perhaps a longer or more intensive retention phase is needed—one that more closely parallels the length and intensity of the enrollment phase. In the current study, the EM specialists worked with women for only 4 weeks after entry into a drug abuse treatment program. Perhaps extending the length of the program to 90 days would have yielded better long-term retention results. Second, given the importance of treatment readiness in promoting retention, individual sessions with the mother focusing specifically on issues of treatment readiness might be included in the enrollment and/or retention phase. Third, it might help to have more sessions with the family focusing on how they can enhance the mother's readiness (e.g., reinforcing the necessity of treatment, convincing the mother that she is ready to benefit from treatment, and encouraging the values of staying in treatment). Finally, it might be useful to change the service delivery context. Efforts to increase retention might have been more successful if the EM Program had been incorporated into the treatment programs and, thus, delivered as an integral part of drug abuse treatment and not as an independent adjunct. Nevertheless, the overall results suggest that the EM Program approach has considerable promise and brings into relief certain intervention development possibilities.

It is important to highlight some of the limitations of this study, including its (a) homogeneous sample, (b) service delivery setting, and (c) unequal number of contact hours provided in the two conditions. This study focused on cocaine- and crack-using urban, Black, low-income mothers of infants. It is not known whether the

results would generalize to women from other racial/ethnic groups, who abuse other classes of drugs, live in suburban or rural areas, or have older children. It also is not known how a similarly designed program for men or fathers of young children would fare. However, it should be noted that even though the sample was composed of all Black women, the EM Program was not an Afro-centric or race-specific intervention. Issues concerning gender, social class, drug abuse, and family guided the development and administration of the intervention more than race. Next, it is important to recognize that this study was conducted in a university research setting, with few practical barriers to implementation of the program. As a result, its transportability to practice settings is unknown. For example, the EM specialists had relatively low caseloads, which is not always obtainable in community settings. Perhaps more important, the EM Program was completely independent from any agency that, from the women's point of view, could harm them, such as the state Child Welfare Department or dependency court. It is likely that the program's independence from agencies that could negatively influence the women's future facilitated the development of an emotionally close and trusting relationship between the EM specialist and the women.

Another important limitation stems from the unequal amount of contact that, by design, the women had with the experimental and control conditions. Because our primary interest was in the potential additive effect of a manualized enrollment and retention intervention, the number of contacts was intentionally confounded with type of intervention received, making it difficult to determine the contribution of dose to outcome. Therefore, it would be useful to keep amount of contact equal and compare the EM Program with other enrollment and retention interventions, such as motivational interviewing (W. R. Miller & Rollnick, 1991), community reinforcement and family training (W. R. Miller et al., 1999), or cognitive node-link-mapping techniques (Simpson et al., 1997).

Despite these limitations, the results of this study reveal a promising treatment enrollment intervention and short-term retention and suggest viable treatment development possibilities with respect to enhancing its influence on longer term retention. The health, social, and familial consequences of drug use in the child-bearing years; the unavailability and underutilization of drug treatment; and the low rates of enrollment and retention in drug treatment all combine to create a public health problem in urgent need of innovative and effective solutions. Clearly, improving treatment entry and retention among drug-addicted mothers is an important step in solving this challenging and costly health care problem (Andres, 1996; Hoffman et al., 1996).

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