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Effects of Family Treatment on Parenting Beliefs Among Caregivers of Youth with Poorly Controlled Asthma

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Abstract

Objective—Caregiver involvement is critical to ensuring optimal adolescent asthma management. The study investigated whether Multisystemic Therapy (MST), an intensive, home-based family therapy, was superior to family support for changing beliefs regarding asthma-related positive parenting among caregivers of African-American youth with poorly controlled asthma. The relationship between parenting beliefs and asthma management at the conclusion of the intervention was also assessed.

Methods—A randomized controlled trial was conducted with 167 adolescents with moderate to severe persistent, poorly controlled asthma and their primary caregivers. Families were randomly assigned to MST or FS, a home-based family support condition. Data were collected at baseline and seven month post-test. Changes in caregiver ratings of importance and confidence for engaging in asthma-related positive parenting were assessed via questionnaire. Illness management was assessed by the Family Asthma Management System Scale (FAMSS).

Results—Participation in MST was associated with more change in caregiver beliefs as compared to FS for both importance ($t = 2.39, p = .02$) and confidence ($t = 2.04, p = .04$). Caregiver beliefs were also significantly related to youth controller medication adherence at the conclusion of treatment (importance: $r = .21, p = .01$; confidence: $r = .23, p = .004$).

Conclusion—Results support the effectiveness of MST for increasing parental beliefs in the value of asthma-related positive parenting behaviors and parental self-efficacy for these behaviors among families of minority adolescents with poorly controlled asthma.

Keywords

Asthma; Self-Management; Adolescents

Pediatric asthma causes high rates of functional morbidity, including school absences, frequent doctor visits, and hospitalizations.¹ Adolescents with asthma are even more at risk than younger children for increased morbidity and mortality.² In addition, significant health disparities are evident in rates of asthma prevalence and morbidity. Asthma is 26% more prevalent among African-American youth than White youth³ and African American youth experience more emergency room visits, hospitalizations, and fatalities from asthma than Whites.⁴ Disparities in pediatric asthma health outcomes occur due to multiple factors,⁵ including prematurity, exposure to air pollutants and parental cigarette smoking. However, improving illness management may be one way to improve health outcomes among African American adolescents with asthma. Ethnicity has consistently been found to be related to asthma management, with minorities reporting lower rates of adherence to a variety of asthma care tasks than Whites.⁶

Appropriate asthma management requires not just factual knowledge about the disease but engaging in complex decision making,⁷ which may be difficult for many adolescents. Given their cognitive immaturity, including a limited degree of concern about their future health status, adolescents may also view the completion of preventive asthma care such as use of controller medications as unnecessary and as interfering with preferred activities.⁸ Therefore, caregiver involvement in asthma care, including provision of support for care completion and oversight to ensure that care is actually completed, is critical to adequate adolescent illness management.⁹

Despite the importance of parental involvement, parents of African American youth with asthma face barriers to involvement with adolescent asthma care. These include a higher likelihood of being a single parent¹⁰; single parents not only have lower social support for asthma care,¹¹ but are also more likely to work outside the home¹² and may not be present when the youth completes asthma care tasks. One study showed that African American parents reported more competing life and family demands that interfered with asthma care than did White parents.¹³ African American parents are also disproportionately affected by stressors such as neighborhood disruption and crime¹⁴ that can impact parenting. Therefore, although it is clear that parental involvement is a critical component of successful adolescent asthma management, parental involvement with asthma management may be negatively affected by the contextual factors faced by African American families.

Whether or not a parent engages in a particular parenting behavior, such encouraging and promoting appropriate adolescent illness management, has been shown to be heavily influenced by parenting beliefs.¹⁵ Parenting beliefs include parental cognitions regarding the value, or importance of engaging particular parenting behaviors.¹⁶ For example, one study of chronically ill youth showed that parental prioritization of disease-specific parenting

goals, such as promoting good child health status and illness management, predicted subsequent levels of parent involvement in illness management six months later.¹⁷ Parenting beliefs also include parents' self-efficacy, or confidence, in their parenting skills. As with parental importance, higher levels of parental self-efficacy have been shown to be related to more parental shared responsibility for illness management with chronically ill youth, while lower parental self-efficacy predicts lower levels of parental involvement in medical care.¹⁸

Given the influence of parenting beliefs on parental engagement in certain parenting practices, intervention researchers have also investigated whether parenting beliefs affect success in family-based interventions to promote child health. The majority of these studies have been carried out in the context of family-based treatments for child externalizing behavior problems such as conduct disorder (e.g., Dekovic, et al¹⁹) and there is limited literature to show whether parenting beliefs play a similar role in the success of interventions with children with physical health problems. However, results from a recent clinical trial for pediatric obesity treatment showed that parents' baseline levels of confidence in their ability to make changes related to their child's eating and activity level were related to subsequent child weight loss at follow-up.

Multisystemic Therapy (MST) is an empirically supported, home-based, family treatment approach originally developed for use with high-risk families of youth with delinquency.²⁰ The MST treatment approach is an excellent fit with the known etiology of poor asthma management because the scope of MST interventions encompasses the individual youth, the family system and the broader community systems within which the family operates (i.e., school, health care system). In addition, the home and community-based nature of MST treatment increases treatment retention among minority populations who are at elevated risk for drop-out from clinic-based services. Our group has previously adapted MST for the treatment of poor illness management among adolescents with diabetes,²¹ HIV infection²² and asthma.²³ As a family-based intervention, MST treatment theory emphasizes the critical nature of engaging caregivers in changing their parenting behaviors in order to effect long-term improvements in health outcomes of high-risk youth.²⁴

The purpose of the present study was to investigate whether MST increased caregiver beliefs regarding asthma-related positive parenting, such as involvement with and oversight of daily asthma care, providing support and positive feedback for engaging in asthma care and setting limits for lack of completion of asthma care. The parent clinical trial tested the effects of Multisystemic Therapy (MST) versus a comparison condition, family support (FS), to improve asthma management and health status among African American youth with poorly controlled asthma. Findings from that trial showed that MST improved adherence with controller medications and lung functioning as compared to the control condition.²³ In the present study, we hypothesized that caregivers receiving MST would have increased self-efficacy for asthma-related positive parenting and would rate these positive parenting behaviors as more important at treatment completion when compared to caregivers receiving FS. The relationship between parenting beliefs and family asthma management at the completion of treatment was also explored.

METHODS

Participants

Youth and their primary caregivers were participants in a clinical trial investigating the effectiveness of MST for improving asthma self-management in urban African American youth with poorly controlled asthma.²³ The design of the parent study from which data for the present study were drawn was a randomized controlled trial of MST. Randomization was stratified based on 1) severity of asthma complications as indicated by number of recent hospitalizations (two or more versus a single hospitalization in the previous 12 months) and 2) location where asthma medical care was received (hospital-based multidisciplinary asthma clinic or community-based primary care provider). The latter stratification was conducted to control for the fact that care in the hospital clinic was provided by a sub-specialist physician (pediatric immunologist) rather than by a general pediatrician or family medicine physician and that youth in the multidisciplinary clinic had access to other types of health care professionals (e.g. social workers, pediatric nurse practitioners) who might not be present in a primary care setting. Data were collected at baseline prior to randomization and at a seven month post-test (immediately after conclusion of the intervention).

In order to be eligible, adolescents had to be between 12 years, 0 months and 16 years, 11 months old, to be diagnosed with moderate to severe persistent asthma, to self-identify as African American and be residing in a home setting (e.g. not in residential treatment) with a caregiver who was willing to participate in treatment. The diagnosis of moderate to severe persistent asthma ensured that enrolled participants would be expected to be prescribed a daily asthma controller medication based on national standards of care²⁵ and therefore that the sample would have more homogeneous asthma management needs than if youth with mild asthma, who might use only quick relief medication, had been included. Poorly controlled asthma was defined as having at least one asthma-related hospitalization or at least two asthma-related emergency department visits in the previous 12 months (verified based on medical records review). No child psychiatric diagnoses were exclusionary with the exception of moderate or severe mental retardation, and psychosis. However, youth with other chronic health conditions requiring medical intervention (e.g., HIV, Type II diabetes, sleep apnea) were excluded. Families were also excluded if they were not English speaking or could not complete study measures in English.

The average age of adolescents and caregivers participating in the present study was 13.58 years ($SD = 1.41$) and 39.71 years ($SD = 8.69$), respectively. 94% percent of caregivers were female. 67% percent of youth were male. 60% percent of caregivers described themselves as single caregivers. The median household income of the sample was \$13,000 – \$15,999. Mean FEV-1 (Forced expiratory volume in 1 second, a measure of lung functioning obtained from spirometry testing) was 2.14 ($SD = 0.65$) at study entry. 41% of youth were followed for asthma care in an immunology specialty clinic in the year prior to treatment while 59% were followed by primary care providers.

Procedure

Potential participants were recruited from a children's hospital in a major urban area. Details of study recruitment and retention are reported in the parent study.²³ In brief, medical records were reviewed to identify a pool of participants who were eligible based upon age and history of asthma-related emergency room visits and/or inpatient admissions at the facility. Of 196 eligible families, 170 or 87% consented to participate and completed baseline data collection. Reasons for lack of study participation included being "too busy" and lack of interest in receipt of home-based services. Two families randomized to FS were removed from the study due to safety concerns that developed during treatment that interfered with the delivery of a home-based intervention; and another family was removed when it was discovered that they did not meet study eligibility criteria. Thus the final analyzed sample was 167 (84 in MST-HC and 83 in FS). An additional 14 families missed the follow-up data collection; 91% of families completed the study follow-up assessment. The research was approved by the Human Investigation Committee of the university affiliated with the hospital where the adolescents were seen for medical care. All participants provided informed consent and assent to participate.

Multisystemic Therapy (MST)—Families randomized to MST received approximately six months of intensive, home and community-based psychotherapy, while families randomized to the comparison condition received six months of weekly family support (FS) visits in the home. Post-test data collection took place seven months after baseline data collection (i.e. treatment completion). All measures were collected by a trained research assistant in the participants' homes. Both the youth and the primary caregiver completed questionnaires. Families were provided \$50 to compensate them for participating in each data collection session.

Adolescents assigned to the intervention condition received Multisystemic Therapy (MST) as adapted to the treatment of poor self-management in youth with chronic illnesses in general and asthma in particular. The MST intervention has been described in detail elsewhere^{21–23} but includes several key features: (a) A comprehensive set of identified risk factors (e.g., across individual, family, peer, school, and neighborhood domains) associated with the problem behavior is targeted through interventions that are individualized for each adolescent (b) These interventions integrate empirically-based clinical treatments (e.g., cognitive-behavioral therapy), which historically have been used to focus on a limited aspect of the adolescent's social ecology (typically only the individual adolescent or at most the adolescent and family), into a broad-based ecological framework that addresses relevant risk factors across family, school, and community contexts (c) Interventions focus on promoting behavioral changes in the adolescent's natural ecology by empowering caregivers with skills and resources to address difficulties inherent in raising adolescents and empowering adolescents to cope with family, school, and neighborhood problems (d) Services are delivered via a home-based model, which facilitates high engagement and low dropout rate and are delivered in home, school, and/or neighborhood settings at times convenient to the family and (e) MST programs include an intensive quality assurance system that aims to optimize youth outcomes by supporting therapist fidelity to MST treatment protocols.²⁶

In the current study, therapists began by conducting a multisystemic assessment of the strengths and weaknesses of the family related to illness management. Based upon this, and the family's treatment goals, interventions were tailored to the needs of each family to best treat asthma management problems. Treatment goals identified conjointly by family members and the therapist during the assessment phase were explicitly targeted for change during the treatment phase. For the proposed study, treatment goals were typically illness management-related (e.g. "takes 90% of controller medications based on medication counts", "carries inhaler when out of the home").

The number of sessions per week was dependent upon clinical need. Sessions could take place several times per week initially and then only weekly once the adolescent's asthma management had improved. Therapists drew upon a menu of evidence-based intervention techniques that included cognitive-behavioral therapy, parent training and behavioral family systems therapy. Of particular relevance to the present study, family interventions used in MST included introducing systems for monitoring and supervising asthma care, increasing consistency in parental support/rewards systems for the youth's appropriate engagement in asthma care and clarifying rules and limit setting when the youth did not complete asthma care. Based on our previous MST trials, treatment was planned to last for six months. Mean length of treatment was 4.97 months ($SD=1.49$) and mean number of sessions was 31 ($SD=14.5$; range=0–62).

MST treatment was provided by four masters-level therapists with varied backgrounds (one psychologist, three social workers). Three therapists were African-American and one was White. In order to promote fidelity to the MST model, state-of-the-art quality assurance protocols were used that included an initial five day training, weekly on-site clinical supervision from a Ph.D. level supervisor with an extensive background with MST and its application to treatment of chronically ill children, weekly phone consultation with an MST expert with experience with the application of MST to chronic health conditions, and quarterly booster training. The initial five-day training was adapted by the research team to include formal asthma education for therapists as well as education regarding factors that are predictive of poor treatment adherence and symptom exacerbations among adolescents with asthma. Therapists were trained to have sufficient knowledge regarding asthma to enable them to conduct asthma adherence interventions with families (e.g. methods of environmental control, differences between use of rescue and controller medications, using asthma action plans for symptom management, etc). Quality assurance protocols also included use of a manual on use of MST with youth with high-risk asthma developed during a feasibility trial²⁷ feedback on therapist and supervisor fidelity to MST procedures^{28,29} and audiotaping of all treatment sessions for supervisory review and fidelity coding.

Family Support (FS)—Families randomized to the comparison group received weekly, home-based, client-centered, non-directive supportive family counseling. Home-based delivery of services was chosen so as to avoid inequity of treatment dose due to ease of access to services (e.g. home versus office). The comparison condition was intended to control for improvement due to non-MST specific treatment factors such as positive family expectancies due to entering treatment, receiving positive regard and encouragement for completing asthma care from therapists, and providing family members with opportunities

to discuss asthma care. Therefore, the weekly visits had three goals: 1) to provide empathic support to the youth and caregivers regarding the adolescent's asthma and related care needs 2) to provide the family with opportunities to discuss barriers they identified to the completion of asthma care, and 3) to discuss the availability of supports to help the family with asthma management. Non-asthma related problems such as family relationship problems could also be discussed during the visits if requested by the family. Therapists accomplished these goals by providing Rogerian, client-centered, non-directive counseling.³⁰ Rogerian interventions emphasize empathic and reflective listening in order to facilitate growth that stems from within the individual. In order to provide support in the areas that were most difficult for the family, therapists began each session by asking open-ended questions regarding asthma management during the prior week. Family members were then verbally reinforced for what was going well; when barriers to care were raised, the therapist did not address these concerns with skills building or problem solving interventions, but rather supported the family to come up with their own ideas regarding ways to address such challenges.

The FS intervention was six months in length and hence was matched to MST for length of treatment. Since MST session dose is flexible, matching the control condition for dose was not possible. Therefore, a weekly 45-minute session consistent with traditional outpatient therapy approaches (and therefore with what would be provided in a real-world setting) was chosen. Mean length of treatment was 3.21 months (SD=2.32) and mean number of sessions was 9.0 (SD=6.3; range=0–24).

FS was provided by 7 masters-level therapists with varied backgrounds (four psychologists, two social workers, and one paraprofessional). Five therapists were African-American and two were White. There was no overlap between therapists providing MST and FF. Quality assurance protocols included a detailed manual, an initial three-day training, and a minimum of bi-weekly on-site clinical supervision from a Ph.D.-level supervisor. All sessions were audio-recorded, and supervisors reviewed one tape per month. Fifteen FS tapes (approximately one per quarter during the intervention phase) were also coded by trained MST coders who were blinded to treatment condition to ensure that MST elements were not present in the comparison condition.

Measures

Parenting Beliefs—Caregiver views of 1) the importance of asthma-related positive parenting behaviors and 2) their confidence that they could engage in these parenting behaviors were each measured using an adapted version of Rollnick's Readiness Ruler.³¹ Parents were asked about three parenting behaviors critical to youth asthma care: Involvement/Supervision, Positive Support/Rewards and Limit Setting/Removal of Privileges. For instance, caregivers were asked 1) how important they felt it was to supervise their teen's use of controller medication on a daily basis and 2) how confident they felt in their ability to supervise the teen's medication taking on a daily basis. Caregivers indicated their ratings of importance and confidence on a scale from 1 (not important/not confident) to 10 (very important/very confident). Items were summed across the three different behaviors to obtain a total importance and confidence score. Such behavior-specific rulers have been

widely used in previous studies; importance and confidence ratings have been found to be related to substance use³² medication adherence³³ as well as treatment outcomes³⁴ in clinical trials of treatment for pediatric obesity. Alpha coefficients for the current study were .80 and .84 for the importance and confidence ruler, respectively.

Asthma Management—The Family Asthma Management System Scale (FAMSS)³⁵ is a clinical interview completed with the primary caregiver and the adolescent that yields ratings on a variety of dimensions of asthma management, including asthma knowledge, relationships with medical providers and medication adherence. Questions are open ended and the interviewer must resolve discrepancies by making standardized judgments regarding degree of asthma management on a 9-point scale with higher ratings indicating better management. The interview takes approximately 45 minutes to complete. The summary measure and several subscales have been found to be correlated with objective measures of asthma management such as electronic monitors and accounted for a significant percentage of variance in asthma morbidity in a sample of youth ages 7 to 17. For the purpose of the present study, the scale assessing adherence to controller medication was used.

Statistical Analyses

The hypothesis that relative to caregivers in the FS group, caregivers in the MST group would have increased beliefs in the importance of asthma-related positive parenting and confidence in their ability to carry out such parenting behaviors was tested by two multilevel models evaluated using SAS PROC MIXED. Importance and confidence served as dependent variables. Models controlled for baseline age, gender, number of caregivers in the home (two-parent vs. single-parent household) and treatment dose (due to the differences in number of sessions across the two conditions). Each model examined the within-person effect of time (baseline, 7 months), the between-person effect of treatment (MST vs. FS), and the interaction between time and treatment group. In each model, there was a random effect for the intercept, which allowed for variation between participants in baseline beliefs. Missing data at the 7-month assessment was accounted for in the multilevel models using maximum likelihood estimation.

RESULTS

Comparability between the two treatment conditions at baseline was tested using Student's t-test for continuous variables and Fisher's exact test for categorical variables. There were no significant differences between the MST and FS groups on caregiver ratings of importance ($t=.97, p=.34$) or confidence ($t=.84, p=.40$) at baseline. Caregivers rated asthma parenting behaviors as somewhat important ($M_{MST}=7.19, SD=2.10; M_{FS}=7.51, SD=2.18$) and rated themselves as somewhat confident in their asthma parenting skills ($M_{MST}=7.44, SD=1.91; M_{FS}=7.71, SD=2.16$) at study entry (at follow-up, importance $M_{MST}=7.78, SD=1.61; M_{FS}=7.60, SD=1.96$; confidence $M_{MST}=7.91, SD=1.60; M_{FS}=7.61, SD=1.96$). There were also no significant differences between groups on demographic variables such as child age, child gender, caregiver age or caregiver gender or indicators of asthma health status such as FEV-1. However, caregivers in the FS condition were significantly more likely to be single parents than those in MST (control 54% vs. MST 41%, $X^2=4.66, p=.03$).

Given the significant difference in numbers of single parents between the groups, this variable was controlled for in subsequent analyses as noted above.

Results of multilevel analyses are presented in Table 1. After controlling for baseline age, gender, two-parent household and treatment dose, significant time by treatment interactions were found for importance ($t=2.39$, $p=.02$) and confidence ($t=2.04$, $p=.04$). As can be seen in Figures 1 and 2, the MST group exhibited increases in importance and confidence between the baseline and 7-month assessment. In contrast, importance and confidence remained stable or declined slightly over time for the control group. Although the test of the interaction term showed a significant difference in rate of change between the MST and FS group on parental importance and confidence ratings, these analyses were also followed up with tests of simple slopes to evaluate the significance of the within-group change. Parents receiving MST had significant increases in both importance ($t=3.21$, $p=.002$) and confidence ($t=2.20$, $p=.03$) from baseline to follow-up while there were no significant changes in importance and confidence for FS families (importance $t= -.35$, $p=.73$; confidence $t= -.79$, $p=.43$). Effect sizes associated with these changes for the MST group were evaluated using Cohen's d and were .36 for importance and .37 for confidence, indicating the changes were small to moderate in magnitude.³⁶

Since dose of treatment was substantially higher in the MST than in the FS group, in addition to controlling for dose in our between groups analyses, we also conducted exploratory analyses to assess the relationship between number of treatment sessions and change in parental importance and confidence ratings over the course of treatment within the two groups. Change scores were calculated by subtracting parent ratings at baseline from ratings at 7 month follow-up. Therefore, higher change scores reflected more increase in importance and confidence. For parents receiving MST, a higher number of treatment sessions was positively and significantly related to change scores for parent importance ($r=.29$, $p=.01$) and confidence ($r=.32$, $p=.003$). However, for parents receiving FS, the number of treatment sessions was unrelated to changes in parent importance ($r=.06$, $p=.62$) or confidence ($r=.14$, $p=.24$). Hence, higher doses of an intervention heavily focused on building parenting skills were related to more increase in parental importance and confidence ratings over the course of treatment, but higher doses of the attention control intervention were not.

Finally, the relationship between parent ratings of importance and confidence and FAMSS ratings on adherence to controller medication at treatment completion was evaluated for the sample as a whole. Higher parent ratings of the importance of asthma-related positive parenting at treatment completion were related to higher levels of adherence to controller medication ($r=.21$, $p=.01$), as were higher ratings of parent confidence ($r=.23$, $p=.004$).

DISCUSSION

Parental involvement in the care of chronically ill children, including parenting behaviors such as provision of instrumental and emotional support and supervision of care completion, has repeatedly been shown to be related to health outcomes.^{37,38} Although youth must acquire the ability to independently manage their chronic condition during adolescence,

sustained parental involvement remains important to the successful navigation of this transition. African American adolescents with asthma are at higher risk for both poorer illness management and health outcomes than majority youth. Therefore, the purpose of the present study was to determine if MST, an intensive family therapy approach with a significant focus on both engaging caregivers in treatment and changing parenting practices, could increase parenting beliefs regarding the importance of engaging in asthma-related positive parenting and confidence to engage in these practices among caregivers of youth with poorly controlled asthma. The degree to which parenting beliefs may change during family treatment and the impact of such changes on adolescent health outcomes has rarely been studied in intervention trials in the chronic illness literature.

In the present study, caregivers receiving MST significantly increased both their reports of the importance of engaging in parenting behaviors related to their child's asthma care and their confidence to carry out these behaviors over the course of treatment as compared to caregivers in the FS condition. While the effect sizes associated with these changes were small, increases in beliefs that such parenting behaviors were important and increased self-efficacy beliefs were associated with better adolescent adherence to controller medication at the conclusion of treatment. As FAMSS ratings are derived from both adolescent and parent report, this increases confidence that findings are not simply an artifact of shared method variance (e.g. parent report).

Changes in parenting beliefs occurred despite the fact that caregivers were part of treatment in both the MST and FS condition and that therapists in the FS condition encouraged family members to engage in good asthma management practices, including have parents assist their adolescent with asthma care. However, clinical observations suggested that at treatment entry, parents in the study often verbalized expectations regarding their adolescent's ability to independently manage their asthma care that were inconsistent with the adolescent's developmental status and actual asthma care skills. Therefore, it appears that directly targeting parenting beliefs as well conducting parenting skills practice- as occurs in MST and in other cognitive-behavioral interventions-may be instrumental in changing parents' perspectives on the value of parental involvement in asthma care as well as their self-efficacy for asthma-related parenting.

The present study has a number of limitations. First, the study reports on outcomes only at treatment termination. Additional follow-up of the sample is needed in order to assess the stability of changes in caregiver beliefs. Because the magnitude of change in parenting beliefs was small to moderate, it is possible that these changes might not be maintained over time. Additional research is necessary to determine the optimal ways to engage parents of adolescents in actively supporting and assisting their youth with asthma care completion. Second, the sample was comprised of urban African American youth with poorly controlled asthma and the generalizability of findings to samples of other ethnicities or with adequately controlled asthma is unknown. Third, although dose was controlled in the primary analyses and exploratory analyses also showed that dose of the FS intervention was unrelated to change in parenting beliefs, the possibility that inequity in dose accounted for the findings cannot be conclusively ruled out in the absence of a trial where dose is equated across conditions. Finally, studies that assess parenting skills directly (for example, through

observational methods) are needed to determine whether changes in parent's beliefs are associated with changes in actual parenting behaviors and practices.

The widespread availability of complex interventions such as MST to high-risk youth with poorly controlled asthma in the future depends heavily upon demonstrations of cost effectiveness. MST is in fact a costly intervention, with costs for youth with poorly controlled diabetes estimated at approximately \$7000 per youth³⁹. However, MST has been shown to produce cost savings when used with a population of youth with poorly controlled diabetes who experienced emergency department visits and/or inpatient admissions³⁹, similar to the target sample used in the present trial. Integration of interventions like MST that use home-based approaches into routine clinical practice may also depend on changes in models of care for complex patients (e.g. those with poor self-management). Consistent with mandates in the Affordable Care Act for the use of patient and family-centered medical homes, organizations such as the American College of Physicians have called for the use of "patient-centered medical neighbors"⁴⁰ in which patients with complex care needs can be managed by both a primary care physicians and other specialty providers (such as an agency providing MST to youth with chronic health conditions).

In summary, results of the present study support the effectiveness of intensive home-based family therapy for increasing minority caregiver's beliefs in the importance of asthma-related positive parenting behaviors and their confidence to engage such parenting practices. Caregiver beliefs can, in turn, promote the health and quality of life of youth with chronic health conditions.

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Figure 1.

Intervention effects on parent report of the importance of asthma-related parenting by treatment group (MST vs. FS). Points plotted are based on results from multilevel modeling, after controlling for adolescent age, gender, and single-parent status.

Figure 2.

Intervention effects on parent report of their confidence in asthma-related parenting by treatment group (MST vs. FS). Points plotted are based on results from multilevel modeling, after controlling for adolescent age, gender, and single-parent status.

Table 1
Results of Multilevel Analyses to Predict Parental Beliefs Regarding Positive Parenting

Predictor Variables	Indicators of Parent Beliefs (Outcome Variables)									
	Importance					Confidence				
	<i>b</i>	<i>SE(b)</i>	<i>t</i>	<i>p</i>		<i>b</i>	<i>SE(b)</i>	<i>t</i>	<i>p</i>	
Time (months)	-.01	.03	-.36	.72		-.02	.03	-.79	.43	
Treatment (0=FS, 1=MST)	-.37	.31	-1.21	.23		-.31	.30	-1.04	.30	
Two-parent household (0=single parent)	<.01	<.01	-.86	.39		<.01	<.01	-1.78	.08	
Gender (1=Female)	-.18	.30	-.61	.54		-.37	.27	-1.36	.18	
Age at baseline (mean-centered)	-.02	.11	-.19	.85		-.01	.10	-.13	.90	
Time x treatment interaction	.09	.04	2.48	.01*		.09	.04	2.10	.04*	