
A culturally competent asthma management intervention: a randomized controlled pilot study

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Background: Despite significant medical advances, many ethnic and racial minority children who live in inner cities continue to experience disproportionately high levels of asthma morbidity and mortality compared with white children. As a result, a growing number of psychosocial asthma management interventions are being developed to address their needs; however, only a few of these interventions have incorporated cultural variables into their treatments and have had their efficacy evaluated.

Objective: To examine the efficacy of the Multifamily Asthma Group Treatment (MFACT), designed to enhance asthma management and reduce emergency department (ED) visits among African American and Hispanic families.

Methods: Twenty-four African American and Hispanic families who have children with asthma were randomly assigned to either the MFACT or the Standard Psychoeducational Asthma Intervention. Differences in the number of ED visits and the level of asthma management in both groups were compared 1 year before and 1 year after the intervention. In addition, these groups were contrasted to a control group that did not receive any psychoeducational intervention.

Results: The MFACT was significantly ($P = .04$) more effective than the Standard Psychoeducational Asthma Intervention and the control in decreasing ED visits and increasing parental asthma knowledge.

Conclusions: These preliminary results suggest that the MFACT is efficacious in enhancing asthma management and in reducing ED visits in inner-city African American and Hispanic children from a lower socioeconomic background.

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INTRODUCTION

Asthma is the most common chronic illness of childhood and is one of the most frequent reasons for visits to pediatricians and emergency departments (EDs).^{1–4} Data from the past 3 decades also suggest that childhood asthma is increasing in prevalence,^{1–2,4} particularly among ethnic minority children living in inner-city areas.⁵ Many ethnic and racial minority groups do not yet completely share the hope afforded by remarkable scientific advances in managing asthma symptoms. Many African American and Hispanic children living in cities continue to have disproportionately high rates of asthma morbidity and mortality compared with any other ethnic group in the United States.^{5–7} Asthma is the leading cause of hospitalizations for urban school-aged children in many areas in the United States, and African Americans and Hispanics are overrepresented in this group.⁵ Furthermore, African American and Hispanic children with asthma are rushed to EDs significantly more often than white children. For example, studies report that African American children with asthma were 4 times more likely to visit the ED than

white children (22.0 vs 4.9 visits per 1,000 population).^{1,8} The overall cost of asthma in 1998 was \$11.1 billion: \$7.3 billion for direct costs (eg, hospitalizations) and \$3.8 billion for indirect costs (eg, missed school days). Costs for ED visits represented almost 18% of the direct costs.¹

Although the US Census Bureau⁹ estimated that African Americans and Hispanics currently constitute almost a quarter of the American population and that by 2050 they will compose almost 50% of all residents of the United States, this vertiginous demographic expansion has not been followed by significant improvements in the accessibility and quality of health services. In fact, the ethnic disparity in health services continues to widen.^{1,5,6} Two main sets of factors—socioeconomic and cultural variables—have been associated with this growing gap.⁵ Numerous studies^{5,10} have documented an association between poverty and elevated levels of asthma morbidity and mortality. Many minorities living in poverty cannot pay for required asthma treatment devices and medications, such as metered-dose inhalers, nebulizers, and peak flow meters. Furthermore, many of these families cannot afford the time to appropriately manage their child's health issues.^{5,10}

In addition, cultural differences also affect the way in which health services are delivered.^{11,12} An important common cultural characteristic that African American and Hispanic families often share, which may differ from the delivery of mainstream health services, is patients' self-orientation.¹¹ Triandis et al¹³ explained that self-orientation is the way in which people understand themselves and their worlds. He identified 2 orthogonal dimensions: idiocentrism and allocentrism. Idiocentrism, or individualism, has been

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defined as people's tendency to understand themselves in isolation from others, emphasizing self-attributes and self-goals; allocentrism is conceptualized as people's tendency to understand themselves in relationship to others, highlighting interpersonal relationships and group/family goals.¹³ Although there is clearly much intragroup variation, whites often tend to understand themselves in idiocentric ways, whereas many ethnic minorities understand themselves in allocentric terms.¹³⁻¹⁵

The expert panel report entitled *Guidelines for Diagnosis and Management of Asthma*, revised in 1997,⁷ has the goal of informing patients and clinicians about appropriate decisions for optimal asthma care. Given the critical importance of cultural differences regarding the delivery of health services, this revision has accordingly started incorporating culturally competent suggestions for managing asthma, such as a new section on "Assessing and Responding to Cultural and Language Differences." This section includes helpful suggestions, such as asking patients open-ended questions about what asthma means in their communities, but it does not inform providers on how to use these cultural differences as assets in the management of asthma symptoms.

Extensive evidence^{7,8,16} indicates that many ethnic minority inner-city children and their parents continue to exhibit asthma management levels that do not conform to current National Heart, Lung, and Blood Institute guidelines. As a result, a growing number of innovative psychoeducational interventions have been developed to enhance asthma management among ethnic minorities.^{17,18} However, ethnicity is largely a demographic variable that does not explain the meaning of group differences.^{19,20} There are significant individual differences within ethnic groups, and most cross-cultural studies seem to generalize specific cultural variables to different ethnic groups, which may limit the usefulness of these interventions. More specific and explanatory cultural variables are needed to make research truly culturally competent.¹⁹ To develop a culturally competent intervention, it is first important to evaluate the presence of a specific cultural variable that can explain the cultural differences and second to tailor the intervention according to the presence or absence of this variable.²⁰ The Multifamily Asthma Group Treatment (MFAGT) was specifically designed to enhance asthma management in families with a high degree of allocentrism, who are often ethnic minorities. It is argued that individuals who are more allocentric will benefit more from an intervention that emphasizes interpersonal contacts in the family, with other family members, and with health providers. As a result of participating in the MFAGT, it was first expected that the asthma management of children and parents would be improved and second that ED visits by children would decrease compared with before the intervention and compared with the Standard Psychoeducational Asthma Intervention (SPAI) group and the control group.

METHODS

Procedures

This protocol was approved by the institutional review board of the Children's Hospital, Boston. Primary care physicians (PCPs) at a large, inner-city community health center, the Martha Eliot Health Center, which is part of Boston's Children's Hospital, referred patients with asthma to this intervention program. To be eligible to participate in the MFAGT or the SPAI, families had to be of African American or Hispanic descent and had to include children diagnosed by a PCP as having asthma between the ages of 7 and 13 years. Before the intervention, all the families had to agree to participate in this research program by signing informed consent forms and completing time 1 assessments. Children and their parents had to complete asthma management scales. In addition, a review of the children's medical records was used to count the number of asthma-related ED visits during the year before the intervention. After time 1 assessments were completed, families were randomly assigned to the MFAGT group or the SPAI group. Spanish- and English-speaking groups were offered for both interventions. Each family was given \$75 for their participation, and children were awarded prizes and a diploma during the last clinical group session. One year after the MFAGT or the SPAI concluded, time 2 assessments were conducted, which consisted of administering the same asthma management scales as at time 1 and counting the number of ED visits during the year after the intervention.

Intervention

The overall goal of the MFAGT is to improve asthma symptom management as recommended by the National Heart, Lung, and Blood Institute⁷ but in a way that is consistent with the allocentric self-orientation and the socioeconomic context of ethnic minorities. The MFAGT manual had 3 modules: (1) identifying and monitoring asthma symptoms (eg, wheezing) and learning to effectively use medical/contextual resources (eg, peak flow rates and medications) to control these symptoms, (2) identifying and preventing asthma triggers, and (3) preventing and coping with an asthma attack (eg, asthma plans). Each module was taught in 1 hour and was conducted on a different day. Parents and children from different families were included in this intervention. Asthma management includes 2 distinct components: asthma knowledge (AK) and asthma skills (AS). The former refers to the necessary information families must have to effectively cope with their children's asthma symptoms, whereas the latter entails a behavioral translation of the information needed to optimally manage asthma symptoms.

The emphasis of the MFAGT was on relational and collaborative asthma management among children, parents, families, their PCPs, and the mental health specialist rather than on learning in isolation from others. Some researchers²¹ found that individuals who are more allocentrically oriented tend to learn more in a cohesive environment in which they can collaborate and work in small groups, whereas individ-

ualistic/idiocentric people learn better in isolation from others. In a manner consistent with the allocentric orientation, the MFAGT discussed strategies to control asthma in a group format that encouraged different members to share different sets of beliefs and concerns about asthma. For example, one family described how they held hands and recalled family stories to prevent the child's wheezing from aggravating and becoming an asthma attack. In this case, the family was encouraged to refine their prediction of an asthma attack by identifying additional symptoms (eg, difficult breathing) while they were encouraged to continue to control asthma symptoms in a relational manner, respecting their allocentric beliefs. A failure to acknowledge and incorporate families' cultural beliefs in the development of any illness management plan may alienate them through miscommunication.²² Thus, the MFAGT encouraged families to interact, explore, and use their own cultural resources as means of managing their children's asthma. For example, many families during the time 2 evaluation, which took place exactly 1 year after their group concluded, reported learning much from one another and being in touch with other families that participated in the same group. Finally, the MFAGT framed patients' asthma symptoms and problems within a historical and socioeconomic context in which health disparities are aggravated by social and economic forces. As a result, families began to experience how socioeconomic injustices also affect their children's asthma care, which in turn often started the process of empowering them to transform their sociocultural context (eg, asking for more information and resources from their PCPs).

The SPAI highlighted the same 3 modules as the MFAGT to parents and children in the same amount of time but differed from the MFAGT in that it did not emphasize the collaborative element of the MFAGT. In contrast to the SPAI, the MFAGT not only sought but emphasized group cohesiveness. The SPAI followed a more structured teaching approach in which a licensed clinician taught the asthma management techniques without attempting to locate asthma symptoms within the socioeconomic and cultural context. Although the licensed clinician in the SPAI elicited different suggestions and did not discourage interpersonal contact between group members, her own recommendations were emphasized. Furthermore, in the SPAI, in contrast to the MFAGT, the proposed asthma management strategies did not explicitly include contingency plans that emphasized cultural resources.

The control group included children with asthma randomly selected from the total pool of patients with asthma (excluding those invited to participate in the MFAGT or the SPAI and those who cancelled or did not attend this intervention). Each of the 11 children in the control group was matched by age, sex, and ethnicity to another child in the MFAGT group. Children in the control group did not participate in any psychoeducational interventions and did not complete any asthma management questionnaires. However, their medical records were reviewed, and the number of asthma ED visits were counted for the year before the start of their matched

MFAGT child and for the year after the intervention concluded.

Participants

Forty-seven families with asthma were invited to participate in either the MFAGT or the SPAI. Forty-nine percent of the families refused to participate or did not attend the intervention. All 24 families that started the MFAGT or the SPAI concluded the intervention, but 2 families did not complete the evaluation 1 year after the intervention. One of the families completed the MFAGT and the other completed the SPAI. These 2 families are not included in the final statistical analyses. Except for 1 father, all the primary caregivers were the children's mothers. Sixteen families (73%) in the overall research sample were Hispanic and 6 (27%) were African American. Thirteen of the children (59%) were boys and 9 (41%) were girls. At baseline, the children ranged in age from 7 to 13 years (mean, 10.2 years). In addition, the medical records of the control group, which included 11 children with asthma, were reviewed. All 33 families that participated in the 3 groups were of a low socioeconomic background.

Measures

Number of Asthma-Related ED Visits

A child's higher number of asthma-related ED visits is commonly used as an indicator of a lower ability to manage asthma symptoms.⁷ Visits to the ED due to asthma were counted for the year before participation in the MFAGT or the SPAI and for the year after participation in either group. An ED visit was considered as such if it appeared on the computer schedule as triage or an ED visit and after a review of the medical records it was found that asthma was the cause of the ED visit. Each asthma ED visit costs an average of \$250 at the Martha Eliot Health Center, where this research took place.

The Individualism-Collectivism Scale

The Individualism-Collectivism Scale, which was used to measure self-orientation, offers a subscale of 16 questions for allocentrism (collectivism/relational) and a subscale of 16 questions for idiocentrism (individualism). All 32 items were included in the scale after being reviewed by experts in 45 different cultures who agreed that each item measured allocentrism or idiocentrism in their countries and in many ethnic groups in the United States.^{13-15,23} Cronbach reliability coefficients, which are a model of internal consistency based on the average interitem correlations of 0.65 to 0.70, were obtained, and appropriate indicators of validity and reliability are reported. In this study, a standardized Cronbach α for allocentrism of .72 was found, which is similar to coefficients previously reported.^{15,23} In the United States, participants have obtained a mean (SD) score of 6.2 (2.0) on the allocentrism subscale and 6.3 (2.0) on the idiocentrism subscale.²³ Higher scores on each subscale indicate stronger self-orientation for that particular dimension, and scores above the mean are considered high. In this study, the evaluated sample

had a high mean (SD) allocentrism score of 7.4 (0.89) compared with other samples and in relation to their mean (SD) idiocentrism score of 5.7 (1.0).^{15,23} These high allocentrism scores make it an ideal match for the MFAGT, which was designed for individuals high on allocentrism. No differences between ethnic groups were found on allocentrism or idiocentrism.

The Asthma Behavioral Assessment Questionnaire

The Asthma Behavioral Assessment Questionnaire (ABAQ) is a 2-part survey that contains an AK test and an AS report.²⁴ The AK test consists of a multiple-choice section, whereas in the AS part, patients respond to statements on a 5-point scale ranging from 1 (never) to 5 (always). A variable for AK was created by assigning 1 point to each correct response and summing the responses provided on the 12 items included. Thus, scores can range from 0 to 12, whereas the AS scores can range from 17 to 85. Higher scores indicate more AS or AK. This questionnaire can be used for children aged 7 to 13 years, and it has also been adapted for adults.²⁵ The child and adult forms have consistently been used in the asthma literature and with ethnic minorities. In addition, the reliability and validity of this scale has been evaluated with ethnic minority families who have children with asthma and are from lower socioeconomic backgrounds.²⁵ In this study, a standardized Cronbach α coefficient of .80 was obtained for the AS component of the ABAQ parent report, and a coefficient of .72 was found for the AS component of the ABAQ children report. Both scores are similar to coefficients previously reported.²⁵ The AK tests of the ABAQ for children and parents are multiple-choice tests; therefore, Cronbach α coefficients were not obtained.

RESULTS

During the year before the intervention, the mean (SD) number of ED visits for the MFAGT group was 2.4 (2.7), for the SPAI group was 1.5 (1.7), and for the control group was 1.1 (1.8). The number of ED visits for these 3 groups did not differ significantly using the Kruskal-Wallis test ($H = 2.3$; $P = .3$). Given that the ED visit distributions were more rectangular than normal, this study used the Kruskal-Wallis 1-way analysis to evaluate differences. Kruskal-Wallis is the nonparametric analog to the 1-way analysis of variance. During the year after the interventions, the mean (SD) number of ED visits in the MFAGT group was 0.7 (0.9), which was lower than that in the SPAI group (1.2 [1.7]) and the control group (1.4 [2.4]). Furthermore, compared with the other groups, the MFAGT group had a larger mean (SD) reduction in the number of ED visits of -1.7 (2.4), or a 71% reduction in the year after the MFAGT was completed. The SPAI group had a mean (SD) reduction in the number of ED visits of -0.3 (0.9), or a 20% reduction in the same period, whereas the control group experienced a mean (SD) increase in the number of ED visits of 0.3 (2.0), or a 27% increase in the same period. The differences in the number of ED visits among the 3 groups a year after the intervention were signif-

icant as evaluated using the Kruskal-Wallis test ($H = 6.096$; $P = .04$). The MFAGT was 50% more effective in reducing ED visits than the SPAI and almost twice as effective as the control group.

During time 1, t tests revealed no significant differences in scores on the 4 ABAQ subscales (ie, the parent AK and AS and the children AK and AS) in the MFAGT group vs the SPAI group (Table 1). All asthma management scale scores significantly increased from time 1 to time 2 in the MFAGT and the SPAI groups, suggesting that both interventions are effective in enhancing asthma management. However, the only subscale score that significantly improved more in the MFAGT group compared with the SPAI group was the parent AK ($t = -3.0$; $P = .009$) (Table 1). Although some subscale scores improved more in the MFAGT group than in the SPAI group, these differences were not statistically significant (Table 1). In addition, no differences between African Americans and Hispanics were found in any of the asthma management variables.

Regarding the cost-effectiveness of this intervention, the total cost of conducting the MFAGT was approximately \$2,295 (including time 1 and time 2 assessments). The cost of the clinician's hour was \$85 for a total of 27 hours. The economic savings in the number of reduced ED visits on the MFAGT (of 71%) for these 11 children was \$4,675. The return on the investment of more than 50% is substantial.

DISCUSSION

Given the small sample used in this pilot study, the generalizability of these findings and the statistical power to support the efficacy of this study are limited. The generalizability of this sample is further limited by the high percentage of families that refused to participate in this study or that did not attend the first appointment, although all the participants who attended the first appointment completed the MFAGT or the

Table 1. Asthma Behavioral Assessment Questionnaire Subscale Scores for Parents and Children in the MFAGT and SPAI Groups*

	Time 1	Time 2
MFAGT group		
AK parents	10.5 (3.3)	13.6 (2.6)†
AS parents	70.3 (8.4)	81.0 (5.2)
AK children	9.49 (3.0)	13.3 (2.0)
AS children	61.7 (13.3)	65.0 (6.0)
SPAI group		
AK parents	11.6 (2.4)	11.7 (2.0)†
AS parents	68.1 (13)	79.5 (10.3)
AK children	8.0 (3.1)	10.0 (3.2)
AS children	59.7 (22.2)	63.8 (12.0)

Abbreviations: AK, asthma knowledge; AS, asthma skills; MFAGT, Multifamily Asthma Group Treatment; SPAI, Standard Psychoeducational Asthma Intervention.

* Scores are given as mean (SD).

† Significant difference between the MFAGT and SPAI groups ($P < .05$).

SPAI. The conclusions of this study are further limited by the possibility that variables not evaluated by the ABAQ are also reducing the number of ED visits. Furthermore, the only treatment fidelity check used to ensure the equivalence of the MFAGT and the SPAI was use of the same content manual (eg, the same 3 modules) for both groups. It is thus possible that the researchers' motivation had an impact on the differences obtained between the MFAGT and the SPAI. The results of this study are exploratory and should be understood as stemming from a pilot study.

However, there are promising results that suggest that the MFAGT is efficacious in improving asthma management and reducing the number of ED visits: (1) parents and children participating in the MFAGT enhanced their AK and AS (significantly more than the SPAI group in parent AK) and (2) the number of asthma-related ED visits by children decreased significantly more in the MFAGT group than in the SPAI group (>50%) and twice as much as in the control group. Furthermore, given this significant reduction in the number of ED visits and the relative low cost of implementing the MFAGT, this intervention is a promising cost-effective intervention strategy. These results provide a promising preliminary evaluation of the utility and logistic feasibility of this culturally competent randomized pilot trial. These results seem to justify further efforts in developing the MFAGT to improve asthma management among inner-city minority children.

Future research could greatly improve on this study by including a larger and more diverse sample that allows for comparison groups such as individuals with low allocentrism, different socioeconomic backgrounds, and different ethnicities. Furthermore, future studies would benefit by including variables other than asthma management to predict changes in the number of ED visits. In addition, we suggest that more complex outcome variables, such as the use of medical care and measures of treatment adherence, be used in conjunction with the number of ED visits. In conclusion, these findings are from a preliminary study and require replication. The fast growth of the African American and Hispanic populations in the United States, their high rates of asthma morbidity and mortality, and the promising preliminary results reported herein underscore the urgency of refining the MFAGT.

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REFERENCES

1. National Center for Health Statistics. *Report of Final Mortality Statistics: 1979–1999*. Bethesda, MD: National Institutes of Health; 2000.
2. Crain EK, Weiss K, Fagan MM. Pediatric asthma care in US emergency departments: current practice in the context of the National Institutes of Health guidelines. *Arch Pediatr Adolesc Med*. 1995;149:893–901.
3. Perrin J, Homer C, Berwick D, Woolf A, Freeman J, Wennberg JE. Regional variation in rates of hospitalization of children. *N Engl J Med*. 1989;320:1183–1187.
4. Pearce N, Beasley R, Burgess C, Crane J. *Asthma Epidemiology: Principles and Methods*. New York, NY: Oxford University Press; 1998.
5. Weitzman M, Gortmaker S, Sobal A. Racial, social, and environmental risks for childhood asthma. *Am J Dis Child*. 1990;144:1189–1194.
6. American Medical Association. Featured CSA report: childhood asthma: emerging patterns and prospects for novel therapies (A-02) full text. Available at: <http://www.ama-assn.org/ama/pub/category/13547.html>. Accessed June 2000.
7. National Asthma Education and Prevention Program. *Expert Panel Report II: Guidelines for Diagnosis and Management of Asthma*. Bethesda, MD: National Heart, Lung, and Blood Institute; 1997.
8. Warman KL, Silver EJ, Stein REK. Asthma symptoms, morbidity, and anti-inflammatory use in inner-city children. *Pediatrics*. 2001;108:277–282.
9. US Census Bureau. *Profiles of General Demographic Characteristics 2000: 2000 Census of Population and Housing: United States*. Washington, DC: US Census Bureau; 2000.
10. Mitchell H, Senturia Y, Gergen P, et al. Design and methods of the National Cooperative Inner-City Asthma Study. *Pediatr Pulmonol*. 1997;24:237–252.
11. US Department of Health and Human Services. *Mental Health: A Report of the Surgeon General—Executive Summary*. Rockville, MD: US Dept of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health; 1999.
12. La Roche M, Turner C. At the crossroads: managed mental health care, the ethics code, and minorities. *Cultur Divers Ethnic Minor Psychol*. 2002;8:187–198.
13. Triandis HC. Theoretical and methodological approaches to the study of collectivism and individualism. In: Kim U, Triandis HC, Kagitçibabi Ç, Choi SC, Yoon G, eds. *Individualism and Collectivism: Theory, Methods, and Applications*. Thousand Oaks, CA: Sage; 1994:41–51.
14. Coon HM, Kemmelmeier M. Cultural orientation in the United States: re-examining differences among ethnic groups. *J Cross Cult Psychol*. 2001;32:348–364.
15. La Roche M, Turner C. Self-orientation and depression level among Dominicans in the United States. *Hisp J Behav Sci*. 1997;19:479–488.
16. Finkelstein JA, Lozano P, Shulruff R, et al. Self-reported practices for children with asthma: are national guidelines followed. *Pediatrics*. 2000;106:886–896.
17. Evans R, Gergen P, Mitchell H, et al. A randomized clinical trial to reduce asthma morbidity among inner-city children: results of the National Cooperative Inner-City Asthma Study. *Pediatrics*. 1999;135:332–338.

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18. Yoos HL, McMullen A, Bezek S, et al. An asthma management program for urban minority children. *J Pediatr Health Care*. 1997;11:66–74.
 19. Helms JE, Jernigan M, Mascher J. The meaning of race in psychology and how to change it: a methodological perspective. *Am Psychol*. 2005;60:27–36.
 20. Sue DW, Sue D. Counseling the culturally different. New York, NY: Wiley Press; 2003.
 21. Kagan S. Cooperative learning and sociocultural factors in schooling. In: Cortes C, ed. *Beyond Language: Sociocultural Factors in Schooling in Language Minority Students*. Berkeley: University of California Press; 1986:281–285.
 22. Kleinman A. *Rethinking Psychiatry: From Cultural Category to Personal Experience*. New York, NY: Free Press; 1988.
 23. Singelis T, Triandis H, Bhawuk D, Gelfand M. Horizontal and vertical dimensions of individualism and collectivism: a theoretical and measurement refinement. *J Cross-Cult Res*. 1996; 29:240–276.
 24. American Institute for Research. *Air Power: Management of Asthma Through Group Education*. Bethesda, MD: National Heart, Lung, and Blood Institute; 1989.
 25. Rubin DH, Bauman LJ, Lauby JL. The relationship between knowledge and reported behavior in childhood asthma. *Dev Behav Pediatr*. 1989;10:307–312.
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