

Community Organization to Reduce the Need for Acute Care for Asthma Among African American Children in Low-Income Neighborhoods: The Neighborhood Asthma Coalition

Edwin B. Fisher, PhD*†§; Robert C. Strunk, MD§; Linda K. Sussman, PhD||; Roslyn K. Sykes, RN, PhD¶||; and Mark S. Walker, PhD‡

ABSTRACT. *Background.* Low-income African Americans exhibit disproportionate prevalences, morbidity rates, and mortality rates for asthma.

Objective. To determine whether a community-based intervention, the Neighborhood Asthma Coalition (NAC), conducted through a well-established neighborhood organization in St. Louis could improve awareness of asthma, change attitudes about its care, improve asthma management practices, and reduce the need for acute care for asthma.

Methods. The NAC included educational programs for parents and children, promotional activities, and individualized support provided by trained neighborhood residents. African American children, 5 to 14 years of age, with at least 1 incident of acute care (emergency department visit or hospitalization) within the previous year were enrolled from 8 zip code areas with low-income residents and high proportions of Medicaid-eligible children, ie, 4 NAC neighborhoods and 4 comparable control neighborhoods. Evaluations included quarterly telephone interviews to assess asthma attitudes and management and sites of care. Audits of acute care sites covered 12 months before initiation of the NAC through 3 years of the program.

Results. A total of 371 patients were contacted and determined to be eligible for the study, and 345 agreed to participate, representing a recruitment rate of 93%. Of those, 15 withdrew and 24 were lost to follow-up monitoring after the initial contact. In addition, 57 were excluded from analysis because of relocation or for other reasons. Utilization data to determine rates of acute care (emergency department visits and hospitalizations) were collected for 249 patients (100 NAC subjects and 149 control subjects). Acute care rates decreased for both the NAC and control groups from the year before intervention to the last year of intervention, with no significant differences between the NAC and control groups. Participation in NAC programming affected the acute care outcome; the NAC-low participation and control groups did not differ but the NAC-high participation group differed significantly from the pooled control and NAC-

low participation groups in reductions in acute care rates. Both contacts with NAC staff members and attendance at educational events were associated with changes toward stronger views that asthma can be managed (partial correlation = .27 and partial correlation = .24, respectively). Structural equation modeling demonstrated that participation in the NAC was associated with positive changes on the Index of Asthma Attitudes scale and lower rates of acute care. Social isolation was associated with greater participation in the program and thus reduced care rates.

Conclusions. The NAC reached its intended audience, including those who were socially isolated, brought about changes in management practices, and was associated with promising reductions in acute care rates among active participants in the program. *Pediatrics* 2004;114:116–123; *childhood asthma, acute care, community-based intervention, asthma attitudes, social isolation, participation in programming.*

ABBREVIATIONS. NAC, Neighborhood Asthma Coalition; ED, emergency department; CASS, Change Asthma With Social Support.

In the United States, minority groups with diverse racial and ethnic heritages experience disparities in asthma care that result in differentially high morbidity and mortality rates.¹ African American patients are 3 times more likely to be hospitalized and 4 times more likely to die as a result of asthma than are white patients.^{2–10} In addition, asthma morbidity rates are higher among urban populations. Among urban African American children, this increase in asthma morbidity rates parallels overall rates of poor outcomes resulting from health problems.^{2,11–16} Prominent among issues resulting in increased asthma morbidity rates is the absence of regular care.^{16–19} Urban children experience more difficulty in managing their asthma for a variety of reasons, including poverty, exposure to environmental triggers, stresses of living in an urban area, lack of family and community support, lack of knowledge regarding asthma and community support, and lack of knowledge regarding asthma and its treatment.^{12,13,20–22}

The current approach to asthma management, emphasizing management of exacerbating factors, adherence to medication regimens, and related management skills,²³ has been extended to underserved, low-income, minority groups.²⁴ Low-income African American adults seem to respond well to such edu-

From the Departments of *Psychology and ||Anthropology, Washington University, St Louis, Missouri; Departments of ‡Medicine and §Pediatrics, Division of Allergy and Pulmonary Medicine, Washington University School of Medicine, St Louis, Missouri; and ¶School of Nursing, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

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Reprint requests to (R.C.S.) Department of Pediatrics, Washington University School of Medicine, Division of Allergy and Pulmonary Medicine, St Louis Children's Hospital, 1 Children's Place, St Louis, MO 63108. E-mail: strunk@kids.wustl.edu

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cational intervention.²⁵ However, such education alone may not reduce the disproportionate burden of asthma,²⁶ because access to care is also a problem.²⁷⁻³⁰ In addition, we have found asthma care among low-income African American patients to be complicated by attitudes reflecting acceptance of inadequate care.³¹

Parents of inner-city African American children with asthma have accepted indigenous community health workers.³² This result suggested that indigenous workers based in a community organization might be effective in reducing asthma morbidity rates. Community organization programming extends beyond those with the particular problem to recruit informal networks and social forces within the community, to communicate and encourage behavior-change objectives.³²⁻³⁹ Isolation from formal channels of information may contribute to the reduced utilization of professional health services noted above.⁴⁰⁻⁴³ African American subjects may be more influenced by informal networks of friends and family and may use their extended kin network for social support more often, compared with white subjects.⁴⁴ Use of a community organization might be able to take advantage of these informal channels.

Educating the entire community and not just patients and families may be especially pertinent for asthma. Neighborhood residents should appreciate and support regular asthma care and timely responses to asthma emergencies. Optimal asthma care is provided by parents who understand the seriousness of asthma and know how to care for it; when the knowledge of the parents is incomplete, however, a friend or relative may recognize when something is wrong and help instigate needed actions. Here we report on a community-based intervention conducted through a well-established neighborhood organization in St. Louis. The primary goal of the intervention was to improve awareness of asthma among parents of children with asthma and generally in the community, thereby changing patterns of care and reducing the need for acute care for asthma.

METHODS

Participants

Inclusion criteria selected African American children, 5 to 14 years of age, who were examined in the emergency department (ED) or hospitalized for treatment of asthma at St. Louis Children's Hospital and who lived in 1 of the 4 neighborhoods served by Grace Hill Neighborhood Services (the community collaborator in this program) or in 1 of 4 control neighborhoods in the same general area of St. Louis, with sociodemographic characteristics similar to those of the Grace Hill neighborhoods. Children were excluded from consideration if they did not live in 1 of the 8 neighborhoods or did not have a physician diagnosis of asthma, according to parent report. Potential candidates were identified from medical records. Children were identified to receive a call if they had an address in 1 of 4 zip codes within the boundaries of the Grace Hill service area (Neighborhood Asthma Coalition [NAC] participants) or in 1 of 4 zip codes in the same general area of St. Louis but not in the Grace Hill service area (control participants). Telephone numbers were obtained from the medical records, and parents were called to confirm eligibility (residence in the study neighborhoods, diagnosis of asthma, and age) and to determine interest in participation in the study. Participation was to include the initial telephone call and quarterly telephone interviews for a 3-year period. If the parents were interested, then an

interview was conducted over the telephone and an informed consent form and a release for review of medical records at all sites of care were mailed. Subjects were paid \$15 for the initial and final telephone interviews and \$10 for the intervening quarterly telephone interviews. The Washington University School of Medicine internal review board approved the informed consent and enrollment procedures.

It is important to note that, for those living in the NAC neighborhoods, parents' agreement to be enrolled in the study entailed only a commitment to complete telephone interviews, for which they were compensated, and to allow auditing of their children's utilization of medical care for asthma. They made no commitment to participate in program activities. Therefore, subsequent participation and outcome data represent the ability of programs like the NAC to reach this underserved, high-priority audience.

Figure 1 presents a flow diagram of the enrollment of patients in this study. As indicated, 501 patients were considered potentially eligible. Of these, 371 patients (74%) could be reached by telephone and were determined to be eligible for the study. A total of 345 agreed to participate, which represents a recruitment rate of 93% of those who could be reached and were found to be eligible. Of those who were enrolled, 15 withdrew and 24 were lost to follow-up monitoring after the initial contact. In addition, 57 subjects were excluded from analysis because of relocation or for other reasons. Because the NAC was expected to have an aggregate effect during the entire 36 months it was implemented, 40 evaluation cohort members who moved out of NAC neighborhoods were excluded from analyses. Eleven who moved out of control neighborhoods were also excluded from analyses. This left 249 patients (100 NAC patients and 149 control patients) for whom utilization data were collected. This represents the final sample size used in the primary analyses. Of these 249 patients, 218 (87.6%) completed the final telephone survey, 24 to 36 months after enrollment.

NAC Intervention Program

The program was developed to emphasize neighbor-to-neighbor support and encouragement of asthma management through the Grace Hill Wellness Initiative, which includes neighbor involvement in governance through neighborhood-based Wellness Councils. Grace Hill Neighborhood Services is a health and social service agency that has been active in low-income neighborhoods of St. Louis for >95 years. The present program was conducted in 4 separate neighborhoods in St. Louis, with populations that were predominantly low income and African American.

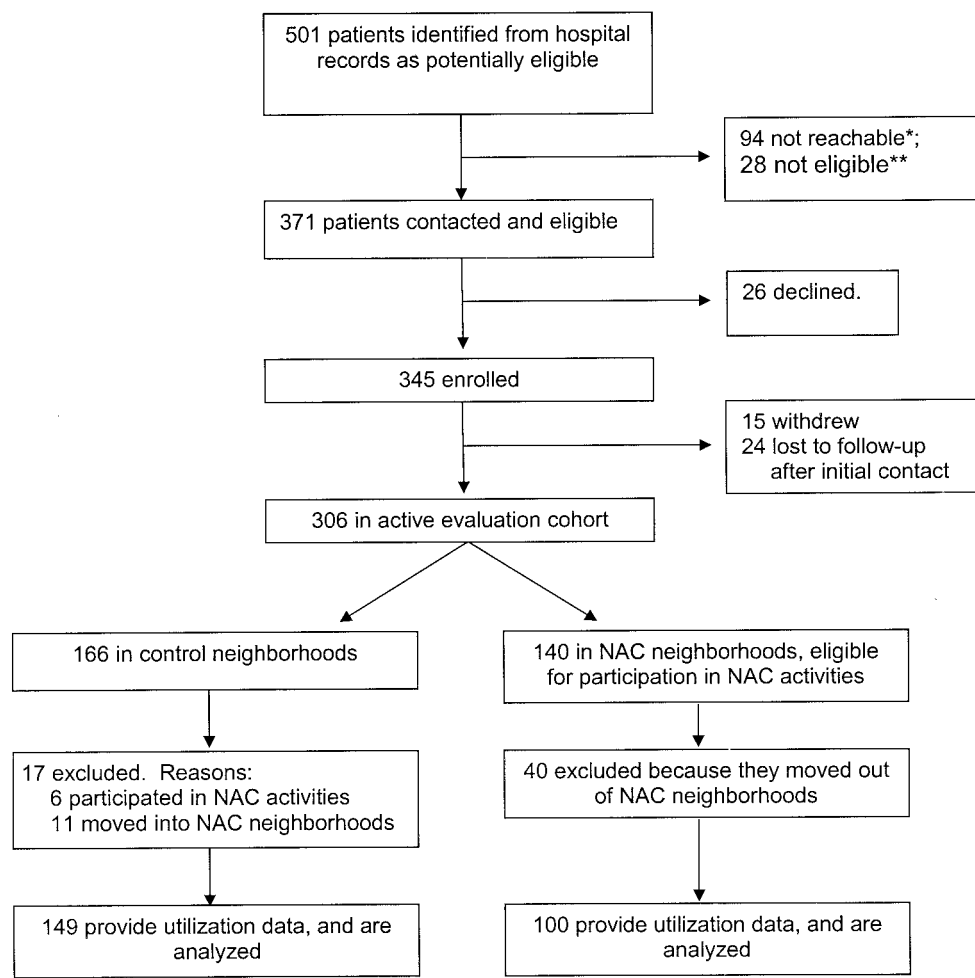
The NAC included promotional campaigns to increase awareness, asthma management courses (based on the American Lung Association Open Airways program) in schools and neighborhood settings, involvement of neighborhood residents in planning programs, training of neighborhood residents to implement asthma management classes, recruitment of neighborhood residents to assist in NAC activities, and recruitment of neighborhood residents to act as Change Asthma With Social Support (CASS) workers, providing basic education and support to parents and children. Details of the rationale⁴⁵ and of the development and implementation of the program⁴⁶ were published previously.

Primary Outcome Measure: Acute Care

At every quarterly interview, parents were asked to identify any hospital from which their child had received care in the previous 3 months. Success in reaching parents eligible for each of the quarterly telephone assessments averaged 83.2% across quarters and ranged from 57% to 89%.

For each child, the resulting lists of possible hospitals were aggregated across the quarterly surveys. On the basis of those findings, ED and hospitalization records were audited for each child for all hospitals that had been reported by the child's parent in any of the surveys. A composite measure of acute care was defined as the sum of hospital admissions and ED visits at which prednisone was administered. The qualification of prednisone administration was designed to eliminate use of the ED as an alternative source of primary care, in the absence of acute clinical need.

The audits of acute care recorded data beginning 12 months before initiation of the NAC and continuing throughout its implementation. The NAC was implemented for a period of 36 months, with recruitment during the first 12 months; participation ranged



*Not reachable: wrong number 17%, disconnected 12%, no answer and no response letters sent 60%, unlisted phone or no phone 11%
 **Not eligible: moved 62%, denied asthma 32%, wrong age 6%

Fig 1. Flow diagram of enrollment of patients in the study.

from 36 to 24 months, depending on when patients were recruited during the course of the study. Therefore, utilization data reflected periods of 36 to 48 months, including the 12 months before program initiation. Data were abstracted, for each case, to correspond to the 12 months preceding the qualifying ED visit or hospitalization and the 12 months preceding completion of the final telephone survey assessment. Analyses of acute care rates thus reflect changes from the year before entry to the final year of inclusion in the evaluation cohort. Analysis of the primary outcome was possible even for parents who were not reached quarterly, because ED and hospital records were searched for all sources identified during the initial call or any subsequent call.

Evaluation of Program Implementation

For each activity, a log of attendance was maintained by the CASS workers and submitted for entry to the data center at the Washington University School of Medicine. CASS workers also kept logs of ongoing contacts with parents, which were collected and entered into the database.

Measures of Asthma Attitudes and Management

Telephone Interviews

Parents of children in the study were interviewed at enrollment and then quarterly until the end of the NAC implementation period. During each interview, the address for sending a check for participation and updated telephone numbers were confirmed and recorded for future contacts.

Index of Asthma Attitudes

A number of items on the parent survey assessed the parents' views of asthma as controllable, their own confidence in managing their children's asthma, their confidence in their children's ability to manage their own asthma, and their agreement with the view that, if their asthma is properly managed, children with asthma can lead full active lives. The survey items measuring attitudes toward asthma and its care that were completed at the end of the NAC were subjected to principal-components analysis and analysis of α reliabilities. From these analyses, 4 items formed a scale that assessed viewing asthma as controllable and not a basis for limiting activities. The items on this Index of Asthma Attitudes were as follows. 1) "Do you think that children with asthma can play and run around as much as other children?" 2) "I feel like I can manage my child's asthma very well." 3) "If your child starts to have asthma symptoms such as wheezing or coughing, how sure are you that you can keep the asthma from getting worse?" 4) "When your child is starting to have a problem with asthma, how often can you stop it?"

The first 2 questions were answered in a no/yes format (no = 1, yes = 2). Question 3 had 3 possible answers (not at all sure, a little sure, or very sure), which were collapsed into a 2-point scale, with not at all sure and a little sure being scored as 0 and very sure being scored as 1. Question 4 had 5 possible answers (never, rarely, sometimes, usually, or always), which were collapsed into a 2-point scale, with never, rarely, and sometimes being scored as 0 and usually and always being scored as 1. The 4 items were combined into a single score, coded so that higher scores on the

Index of Asthma Attitudes reflected stronger views that asthma can be managed. Scores ranged from 0 to 4.

Index of Asthma Management

As noted above, studies of asthma-related deaths implicate delayed responses to asthma symptoms.^{47,48} Therefore, an emphasis of the NAC was timely responses to symptoms. To assess the timeliness of parents' responses to their children's symptoms, the parents were read a list of 26 symptoms ranging from mild ("itchy watery eyes") to severe ("blue around lips"). They were then directed to "... stop me when I say the first thing that would make you think that [name] is having more problems with asthma." The interviewer then continued with the list and parents were directed to "... stop me when you hear something that would make you stop what you are doing and do something for [name's] asthma at home." Finally, they were directed to "... stop me when you hear something that would make you decide to get help for [name's] asthma." According to expert judgment, acceptable responses for thinking the child was having problems were "occasional cough," "occasional wheeze," or "cough only after exercise," for doing something at home were "cough at night only," "cough all day but not at night," or "wheeze during the day but not at night," and for getting help were "cough or wheeze that does not get better with medication," "wakes up with cough, wheezing, or shortness of breath," or "cough day and night." Parents were given 1 point for each acceptable response. This created an Index of Asthma Management, on which scores could range from 0 to 3.

Statistical Analyses

Repeated-measures analysis of variance was used to evaluate the effect of NAC on changes in acute care rates between baseline measurements and the end of treatment. Covariates included the age and gender of the child and the mother's educational level. In this analysis, a significant interaction between time (baseline versus end of treatment) and treatment group (NAC group versus control group) would indicate an effect of treatment. Analysis of covariance was also used to examine the effects of treatment group assignment and level of participation in NAC. Analyses were conducted by using SPSS 8.0 for Windows software (SPSS, Inc, Chicago, IL). The significance level for all analyses was set at .05 (2-tailed).

Structural equation modeling was used to analyze the role of participation in NAC within the context of other factors related to changes in acute care rates. We included in this modeling 2 key measures of NAC participation, ie, attendance at educational events or activities and face-to-face contacts with CASS workers. We also included 1) the Index of Asthma Attitudes, 2) the Index of Asthma Management, 3) the mother's educational level, and 4) a measure of the mother's social isolation (a composite of the number of friends and relatives the mothers indicated they could talk to about personal matters or call on for a favor). Previous research using the same measure⁴⁵ found that the mothers' social isolation was associated with more frequent asthma symptoms among children. We did not include the child's age or gender, because those factors were unrelated to acute care rates in preliminary analyses. The participation measures were, by definition, not available for those from control neighborhoods. Therefore, the structural equation modeling analysis was limited to the NAC sample. Models were estimated by using EQS software, version 5.7b (Multivariate Software, Inc, Encino, CA). χ^2 , comparative fit index, and standardized root mean square residual values were used as fit criteria for the overall model, with a comparative fit index of $>.95$ and a standardized root mean square residual of $< .08$ indicating a good model fit.⁴⁹

RESULTS

Demographic Features of Participants and Measures of Participation in Intervention Programming

Table 1 presents key characteristics at baseline for the final sample of 249 subjects. The samples from NAC and control neighborhoods did not differ significantly with respect to any variable. Although the total numbers of acute visits were quite similar for the 2 groups, there was a tendency for those in the

TABLE 1. Baseline Characteristics of Evaluation Samples From NAC and Control Neighborhoods

Variable	NAC	Control	P Value
Mean age of child at baseline, y	9.5	9.5	.96
Male subjects, %	64.0	57.7	.32
Parents less than high school graduates, %	24.7	32.6	.21
Parents owning own home, %	21.0	24.8	.48
Subjects with health insurance, including Medicaid, %	77.0	77.9	.87
Mean acute visits in previous year, <i>n</i>	2.01	1.93	.73
Mean admissions in previous year, <i>n</i>	0.30	0.46	.07
Mean ED visits in previous year, <i>n</i>	1.71	1.47	.24

control neighborhoods to have experienced more hospital admissions in the year before initiation of the NAC.

To assess the reach to the intended audience, appreciable contact with the program was recorded as attending a promotional or educational activity or experiencing face-to-face contact with CASS workers. With this criterion, 66 of the 100 subjects in the final sample from NAC neighborhoods had appreciable contact. Among those 66 subjects, 51 had ≥ 2 appreciable contacts, 40 had ≥ 3 , and 34 had ≥ 4 . With respect to the type of contact, 62 attended ≥ 1 promotional or educational activity, 37 attended ≥ 2 , 26 attended ≥ 3 , and 19 attended ≥ 4 . Fifty-three had ≥ 1 face-to-face contact with a CASS worker, 33 had ≥ 2 , 25 had ≥ 3 , and 20 had ≥ 4 .

An emphasis of the NAC was involvement of parents in program planning and implementation. Sixteen percent of NAC parents participated in at least 1 Wellness Council or program-planning meeting, 17% assisted in actual implementation of a NAC activity, and 26% were involved in promotion of asthma management. In addition, 12 neighborhood residents were trained to administer an asthma management course.

Effects of NAC Intervention on Acute Care Rates

Acute care rates decreased for both the NAC and control groups from the year before intervention to the last year of intervention (Fig 2). Evaluation of differences between the NAC and control groups in changes with time was according to the interaction between time and intervention in the measure of acute care, including covariates of age and gender of the child and educational level of the mother. This difference was not significant ($P = .35$). There was no effect on acute care rates of length of involvement with the program (2 or 3 years of intervention) or the number of telephone evaluation interviews completed after the initial enrollment call and obtaining of informed consent.

Because participation in the NAC was highly variable among the participants, we evaluated whether those who had participated to a substantial extent demonstrated improvements in acute care rates. To do this, our research team developed a consensus definition of "high participation," reflecting regular contact with NAC programming or participation in substantial asthma education. Cases were categorized as "NAC-high participation" if they met at

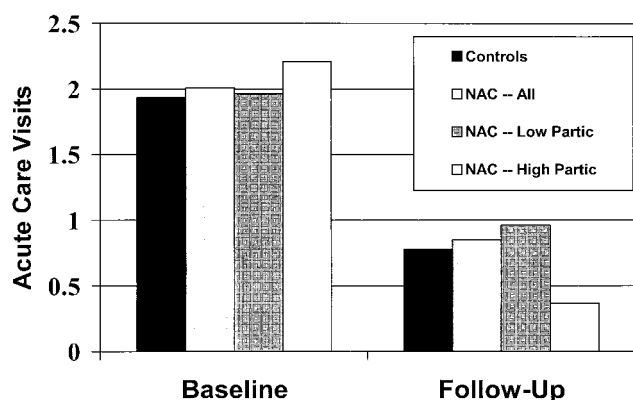


Fig 2. Acute care (ED visits with administration of prednisone and hospitalizations for treatment of asthma) rates. All sites of care reported by the parents in quarterly calls were audited. Results are presented for acute care in the 12 months before enrollment (baseline) and in the last 12 months of participation in the research. Groups are 1) control (control subjects from comparison neighborhoods), 2) NAC-all (all subjects enrolled in the NAC), 3) NAC-high participation (subjects meeting at least 1 of the criteria of attendance at >6 events or classes, >5 face-to-face contacts with CASS workers, or attendance at 1 of several, day-long educational programs on asthma management), and 4) NAC-low participation (those not in the NAC-high participation group). Differences between the control and NAC-all groups with time were not significant ($P = .035$). The NAC-low participation and control groups did not differ ($P = .46$), but the NAC-high participation group differed significantly from the pooled control and NAC-low participation groups ($P = .014$).

least 1 of the following criteria: attendance at >6 events or classes, >5 face-to-face contacts with CASS workers, or attendance at 1 of several, day-long educational programs on asthma management. Only 19% met these criteria for high participation. Figure 2 also presents the levels of acute care at baseline and during the last 12 months of NAC intervention for those in the control, NAC-low participation, and NAC-high participation groups. Univariate analysis of variance tested the differences in acute care rates during the last 12 months of NAC intervention among these groups. This analysis controlled for baseline levels of acute care, as well as the mother's educational level. The NAC-low participation and control groups did not differ ($P = .46$), but the NAC-high participation group differed significantly from the pooled control and NAC-low participation groups ($P = .014$). On the basis of the fact that the children of active participants demonstrated higher levels of acute care in the year preceding the program than did the children of participants who were less active, it seems that the program was effective in reaching and benefiting some of those who most needed it.

Changes in Attitudes About Asthma

From baseline assessment to the final evaluation, those in the NAC group increased scores on the Index of Asthma Attitudes from 1.91 to 2.34 and those in the control group increased scores from 1.91 to 2.24. The overall effect of time was nearly significant ($P = .06$), but the interaction between time and condition was not significant ($P = .35$). Within the NAC cohort, partial correlations evaluated relation-

ships between the Index of Asthma Attitudes and the number of face-to-face contacts with CASS workers and the number of educational events attended. These analyses controlled for the mother's educational status, child's gender, and child's age. Both CASS contacts and attendance at educational events were associated with changes toward stronger views that asthma can be managed (partial correlation = .27, $P = .03$; and partial correlation = .24, $P = .06$; respectively).

Changes in Asthma Management

At baseline, only 30% of the subjects from the NAC neighborhoods indicated that they would seek help at the appropriate point in the escalation of symptoms, ie, cough or wheeze that does not get better with medication. This increased to 43% by 15 months of the NAC intervention and to 51% by the end of the 36-month intervention period. In contrast, at baseline 47% of those in the control neighborhoods indicated that they would seek help if the cough or wheeze does not get better with medication, increasing to 53% by the end of the intervention period. Beginning with worse results than the control subjects for this variable ($\chi^2 = 7.35$, $P < .01$), those in the NAC cohort caught up with the control subjects and did not differ significantly from them by the end of the intervention period ($\chi^2 = .84$, $P = .77$).

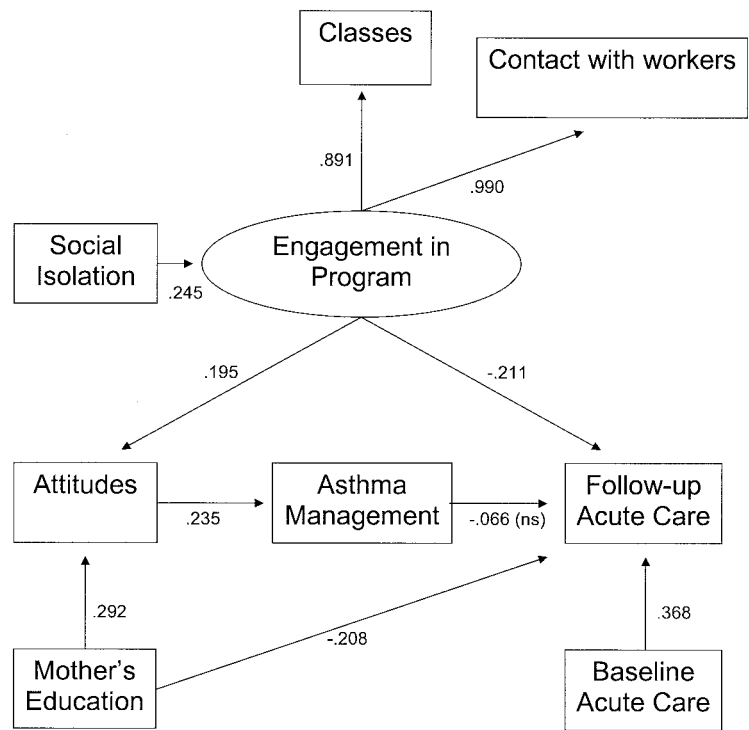
The similar measures indicating when parents stated they would first attend to symptoms or treat them at home yielded disappointing results. At baseline, only 13% of parents indicated that they would begin to pay attention to symptoms at an appropriate time. This value increased to only 17% by the final evaluation. The 2 groups did not differ at either point. Similarly, only 4.5% of parents said at baseline that they would initiate treatment at an appropriate point in symptom progression. This value increased to only 7.3% by the final evaluation, with the groups not differing at either time.

As noted above, an Index of Asthma Management was based on participants' indications of when they would think their child was having problems with asthma, when they would get help, and when they would do something about the child's symptoms. Although scores could range from 0 to 3, consistent with the results for each of the 3 points of taking note of and dealing with symptoms, scores were quite low at baseline (means: 0.61 for control group vs 0.56 for NAC group) and improved only modestly ($P < .01$) by the end of the 36-month NAC intervention (means: 0.80 for control group vs 0.77 for NAC group). The interaction between time and condition was not significant.

Structural Equation Modeling of Changes in Acute Care Rates

Structural equation modeling of changes in acute care rates is presented in Figure 3. The overall model fit the data well and explained 23% of the variance in follow-up acute care rates. Except as indicated, all relationships included were significant at $P < .05$. As can be seen, participation in the program, defined either as contacts with neighborhood workers or at-

Fig 3. Structural equation modeling of changes in acute care rates. Each of the observed variables shown (in rectangles) is defined in the Methods. Engagement in the program is an unobserved variable that is assumed to result in participants' contact with workers and attendance at classes. Numerical values shown are path (regression) coefficients. All relationships were statistically significant at $P < .05$, except as indicated (ns). Independent variables (baseline acute care rate, mother's education, and social isolation) were not significantly correlated. The overall model fit the data well ($\chi^2 [18, N = 100] = 15.45, P = .63$, comparative fit index = 1.0, and standardized root mean square residual = .071).



tendance at educational events, was associated with positive changes on the Index of Asthma Attitudes scale and lower rates of acute care, after controlling for baseline levels of acute care and mother's education. Of special interest is the path from mother's social isolation through participation to reductions in acute care rates. Contrary to concerns that the program might reach only socially active or extroverted mothers, social isolation was associated with greater participation in the program and, through it, reduced acute care rates. The magnitude of the effect was such that participants who were socially isolated would have an average level of engagement >69% of those who were not socially isolated.

DISCUSSION

The community organization approach to chronic disease care used in the NAC accomplished the goals of instituting a neighborhood promotional and educational campaign, encouraging involvement of neighborhood residents in planning and implementing asthma management classes, and recruiting neighborhood residents to provide social support for parents and children. The NAC was able to reach the low-income, minority children and families, who were recruited with no commitment to do anything other than complete telephone interviews. Of these subjects, 66% had ≥ 1 appreciable contact with the program. Contrary to concerns regarding "preaching to the choir," participation in the NAC was positively associated with mother's social isolation, a characteristic that was previously associated with more frequent asthma symptoms among children.⁴⁵ However, the community organization approach was not able to reduce acute asthma care rates. Although acute care rates did decrease during the period of the NAC, there was no difference from the

change observed for a cohort of children from comparable neighborhoods with characteristics similar to those of the NAC group.

During interactions with the community organization implementing the NAC, analysis of the log of attendees and ongoing contacts with parents indicated highly varied levels of participation. This resulted in post hoc analysis of the effect of participation on changes in morbidity rates. In this analysis, participation consistent with sufficient interaction with the program was defined as regular contact with the program through attendance at events or classes, face-to-face contacts with CASS workers, or attendance at day-long education programs on asthma management during the 3-year program. In the group that met these criteria, there was a significant reduction in the acute asthma care rate. Unfortunately, only 19% of the intervention group demonstrated this level of interaction with the program staff. This low percentage of high participators represents a significant limitation of this community effort; it had been expected to encourage much higher levels of extended participation among the parents in the evaluation cohort, although parents were recruited only with a commitment to the evaluation surveys.

Other difficulties encountered included the ability of initial recruitment to the evaluation cohort to reach only 74% of potential participants within 1 month after a significant episode of asthma morbidity. The hospital medical record database apparently did not provide sufficient stable information to reach parents. Contact at the time of the hospital visit might be more effective in enrolling parents in intervention programs, compared with waiting even a short time to call. A substantial reduction in the acute care rate was noted in the control group. Although it

is possible that the quarterly calls for data collection in this group contributed to this reduction, it seems more likely that this represents the course of asthma among children, with the tendency for symptoms to improve with time. Because participation required at least 1 acute care visit during the previous 1 year, it is also likely that the reduction in the control group rate reflected the natural tendency of scores to regress toward the mean. These observations emphasize the need for research using control groups or other design features to address tendencies for asthma morbidity rates to change with time.

Clearly, better ways of engaging parents in active participation in programs must be sought. The limitation of NAC effectiveness to subjects with appreciable participation suggests that interventions to reduce morbidity rates must be designed to increase the involvement of parents and other caregivers. One approach may involve increased use of lay health workers, such as the CASS workers in this program. CASS workers were able to learn about asthma and provide support for parents to administer regular care for asthma and respond early to symptoms. Also, CASS workers could be deployed to actively seek out and recruit nonparticipating or high-risk parents. Substantial research indicates the utility of lay health workers in patient education and the promotion of desirable patterns of screening and care.⁵⁰ Future interventions may benefit from providing more contacts with similarly prepared workers.

Despite the limitations of this study, several of our findings support the community organization approach. First, the NAC was successful in reaching a high percentage of low-income, minority children with asthma and their families, with 66% of the low-income, minority parents who were recruited only to complete telephone interviews having ≥ 1 appreciable contact with the program. This finding is striking, given the challenges of recruiting disadvantaged audiences to health education programs. Although analysis of variance demonstrated that the intervention and control groups did not differ significantly with respect to follow-up acute care rates, results of the structural equation modeling indicated that variability in follow-up acute care rates for the intervention group was explained in part by the level of the participant's engagement in the program. Given the low percentage of participants who were highly engaged, this suggests that, if the engagement of participants can be enhanced, the community approach may be demonstrated to have substantial advantages in reaching those most in need.

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OUR NEW HABITAT

“In the summer of 1996, human habitation on earth made a subtle, uncelebrated passage from being mostly rural to being mostly urban. More than half of all humans now live in cities. The natural habitat of our species, now officially, is steel, pavement, streetlights, architecture, and enterprise—the hominid agenda.”

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Submitted by Student