A cluster-randomized trial shows telephone peer coaching for parents reduces children's asthma morbidity

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Background: Childhood asthma morbidity remains significant, especially in low-income children. Most often, asthma management is provided by the child's primary care provider.
Objective: We sought to evaluate whether enhancing primary care management for persistent asthma with telephone-based peer coaching for parents reduced asthma impairment and risk in children 3 to 12 years old.
Methods: Over 12 months, peer trainers provided parents with asthma management training by telephone (median, 18 calls) and encouraged physician partnership. The intervention was evaluated in a cluster-randomized trial of 11 intervention and 11 usual care pediatric practices (462 and 486 families, respectively). Patient outcomes were assessed by means of telephone interviews at 12 and 24 months conducted by observers blinded to intervention assignment and compared by using mixed-effects models, controlling for baseline values and clustering within practices. In a planned subgroup analysis we examined the heterogeneity of the intervention effect by insurance type (Medicaid vs other).
Results: After 12 months, intervention participation resulted in 20.9 (95% CI, 9.1-32.7) more symptom-free days per child than in the control group, and there was no difference in emergency department (ED) visits. After 24 months, ED visits were reduced (difference in mean visits/child, −0.28; 95% CI, −0.5 to −0.02), indicating a delayed intervention effect. In the Medicaid subgroup, after 12 months, intervention participation resulted in 42% fewer ED visits (difference in mean visits/child, −0.50; 95% CI, −0.81 to −0.18) and 62% fewer hospitalizations (difference in mean hospitalizations/child, −0.16; 95% CI, −0.30 to −0.014). Reductions in health care use endured through 24 months.
Conclusions: This pragmatic telephone-based peer-training intervention reduced asthma impairment. Asthma risk was reduced in children with Medicaid insurance. (J Allergy Clin Immunol 2015;135:1163-70.)

Key words: *Asthma, randomized controlled trial, self-management, peer training, telephone care*

Abbreviations used

ED: Emergency department
EQIPP: Education in Quality Improvement for Pediatric Practice
ICC: Intraclass correlation coefficient
IQR: Interquartile range
PACQLQ: Pediatric Asthma Caregiver's Quality of Life Questionnaire
PCP: Primary care physician
SFD: Symptom-free day
TTM: Transtheoretical model of behavior change

Childhood asthma affects 1 in 10 children in the United States, with greater morbidity in low-income children (the high-risk population).[1] Daily asthma symptoms limit activities, and disease flare-ups result in missed school, missed work, emergency department (ED) visits, and hospitalizations. The estimated direct annual cost of asthma is more than $15 billion.[2]

The child's primary care physician (PCP) usually provides asthma care.[3] National guidelines recommend a collaborative partnership between the family and the PCP with visits at least every 6 months to monitor and adjust the treatment plan as needed.[4] However, many parents find managing their child's asthma to be demanding and stressful[5] and do so outside of the clinical care system,[2] with few office visits to optimize preventive treatment.[6-8] Although many interventions, both patient and provider focused, to improve asthma management have been developed, few have been evaluated for their effect on patient outcomes in large randomized controlled trials. Of those interventions that have been rigorously evaluated, most did not reduce symptom days (median, 0 days; range, 0-24 days) or ED visits (median, 6.5% reduction; range, 0% to 62%) and all failed to reduce hospitalizations.[9-23] Pragmatic approaches to support parents with asthma management are needed.

Building on our prior work using lay coaches to provide tailored education and social support for parents to reduce childhood asthma morbidity,[24-26] we developed a scalable theory-based intervention delivered exclusively by telephone and integrated into primary care. We hypothesized that the intervention would improve asthma outcomes for the child by improving the parent's asthma management and partnership with the PCP. The objective of this randomized controlled trial was to test this hypothesis in both the general and high-risk asthma populations. To minimize contamination of PCP care, we chose a cluster-randomized design, randomizing PCP practices and assessing the intervention effect on patient-level outcomes.

METHODS

Design and setting

The PARTNER intervention was evaluated in a cluster-randomized design stratified on practice location (urban or suburban) to minimize the imbalance

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of sociodemographic factors across study groups. Clusters were pediatric primary care practices in the St Louis metropolitan area. For the primary analysis, we examined the intervention effect after 12 months on 3 patient-level outcomes: (1) symptom-free days (SFDs) for the child, (2) disease-specific parental quality-of-life score, and (3) number of asthma-related ED/urgent care visits (ED visits). Participants were followed for 24 months and reassessed to identify sustained and/or late intervention effects. The study protocol was approved by the Institutional Review Board at Washington University.

Participants

Eligibility. *Clusters.* Eligible practices were community-based primary care practices providing asthma care to 40 or more children.

Participants. Eligible families within study practices had a child between 3 and 12 years of age with a physician's diagnosis of asthma and in the past year had been prescribed a daily controller medication or had 1 or more acute exacerbations that required an unscheduled office visit, a course of oral steroids, an ED visit or hospitalization, or persistent asthma symptoms.[4]

Recruitment and randomization. All potentially eligible practices received a written invitation to participate. The principal investigator met with practice physicians to explain study participation requirements and obtain written consent from 1 PCP per practice. Each practice used billing data to provide the study team with a list of potentially eligible families (those who had received asthma care in the past 2 years, usually identified by International Classification of Diseases, ninth revision, code 493.XX). Subsequently, the practice was randomized to one of 2 study groups by the statistician using a stratum-specific randomization scheme developed with computer-generated random numbers. After randomization, study investigators, PCPs, and parents were aware of study group assignment. All potentially eligible families were contacted by the study team by mail and telephone to invite participation, assess eligibility, and complete the consent process. Parents who provided written consent and completed the baseline interview were enrolled in the study. Each family was paid $20 for the initial interview and $25 for subsequent interviews, and each practice was paid $100 to compensate for administrative time required for study tasks.

After 12 months with 350 families recruited, we extended patient eligibility to include 3- and 4-year-old children to enable us to reach our recruitment milestones. This required us to change our primary measure of asthma impairment from the Asthma Control Questionnaire (not valid if completed by the parent or a child <6 years old)[27] to SFDs that were reported for all trial participants. These changes were approved by the data and safety monitoring board.

Intervention

The content and implementation of the peer-training intervention for the parent was informed by using social cognitive theory[28] and the transtheoretical model of behavior change (TTM),[29,30] which was built on our prior research,[24-26,31] and was delivered exclusively by telephone. Core constructs of the TTM include the stages of change, a series of 5 ordered categories along a continuum of readiness for behavior change (precontemplation, contemplation, preparation, action, and maintenance). Movement along the behavior-change continuum is influenced by cognitive and behavioral processes of change, self-efficacy, and the relative pros and cons of the desired behavior change and can occur in both directions.[30] Targeted asthma management behaviors for the PARTNER intervention included (1) effective use of controller medications, (2) effective use of quick-relief medications, and (3) monitoring of the child's asthma.

Four peer trainers were recruited from the target population, and 3 had experiential knowledge of asthma care. Their initial training occurred over 4 weeks and covered asthma pathophysiology, asthma management, the TTM, building rapport, reflective listening, and communication skills. The peer trainers learned to "stage" a parent for their readiness for each of the targeted behaviors and tailor the intervention to that assessment. Training activities included small-group discussions, experiential learning, and role play. Ongoing training continued with weekly review of taped calls.

An introductory letter and educational materials for use during the intervention were mailed to the parent at the beginning of the program. The assigned peer trainer called within 1 week of enrollment to provide an overview of the program's goals and content; enquire about the child's asthma history, asthma treatment, and treatment goals; and assess the child's level of asthma control (well, partially, or not well controlled) by using 4 questions about the frequency of asthma symptoms and use of quick-relief medications in the past 4 weeks.[4] The parent was asked to read a booklet about asthma in the next week and to provide a confidence score from 1 to 10 to indicate the likelihood this short-term goal would be reached. In this way the peer trainer introduced study processes used during the intervention to facilitate successful behavior change. The second call occurred 1 week later, when the trainer determined whether the parent had achieved his or her short-term goal and further described the program and the 3 targeted asthma management behaviors. In subsequent calls, guided by staging questions and a program manual, the peer trainer provided tailored education, skill training, and support for the 3 targeted asthma management behaviors. Monthly, the trainer assessed the child's level of asthma control and discussed this assessment with the parent. They encouraged PCP visits for routine asthma management at least twice a year, helped the parent prepare for these visits when problems occurred, and, with the parent's permission, provided the PCP a 1-page summary of the child's asthma before each visit and after 6 and 12 months in the program. If needed, the peer trainer provided the parent with contact numbers for community resources.

The program was implemented in a flexible manner, as determined by the parents' needs, circumstances, and preferences and the child's asthma condition. Calls varied in frequency from weekly to monthly, were scheduled at times convenient for the parent, and occurred during office hours from Monday to Friday, with evening appointments available until 8 PM one night per week. Calls were audiotaped and reviewed by the study team to ensure program quality and reviewed by the peer trainers (self-review and peer review) as a learning resource.

Additional features of the intervention targeted the PCPs who provided asthma care. Study physicians (J.M.G. and R.C.S.) conducted 2 site visits to each intervention practice, the first to describe the intervention and determine their preferred communication plan with the peer trainer and the second to discuss management of common problems in asthma care identified by the peer trainers. Asthma management information was also provided in 8 newsletters.

Comparator or control condition

All PCPs in both intervention and control practices were provided with access to the Web-based Education in Quality Improvement for Pediatric Practice (EQIPP) tool from the American Academy of Pediatricians, which was designed to improve asthma care,[32] and a flow chart for recommended administration of albuterol for worsening symptoms. Children in the control group received usual care for asthma from their pediatricians.

Measurement

Measures were obtained at the individual patient level. Measurement occurred during telephone interviews conducted at baseline and 12 and 24 months by trained research assistants blinded to study group assignment. In addition, a study physician (R.C.S.) audited PCP charts by using a structured audit form to assess maintenance asthma visits during the 12 months before and after enrollment.

SFDs were estimated from the frequency of asthma symptoms in the prior 2 weeks,[10,33] and parental quality of life was measured by using the Pediatric Asthma Caregiver's Quality of Life Questionnaire (PACQLQ).[34] This instrument uses a 7-point scale, with a higher score indicating better quality of life. A change of 0.5 units is considered clinically significant.[35] The parent reported the number of ED visits, hospitalizations, and oral steroid courses in the prior 12 months and their attitudes toward, confidence using, and current use of asthma medications.[36] Collaborative partnership with the PCP was defined as having 2 or more asthma maintenance visits per year[4] or a parental report of PCP review of a written asthma treatment plan in the past 12 months.[37]