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Pediatric Primary Care to Help Prevent Child Maltreatment: The Safe Environment for Every Kid (SEEK) Model

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What's Known on This Subject

This is the first study, to our knowledge, of a primary care intervention to prevent child maltreatment. We know that certain risk factors are strongly associated with abuse and neglect. These were targeted in the intervention.

What This Study Adds

The study offers a promising strategy for modestly modifying pediatric primary care to help prevent child maltreatment, and enhance children's health, development, and safety. The model should be replicable, particularly in urban health centers where there is often access to social workers.

ABSTRACT

CONTEXT. Effective strategies for preventing child maltreatment are needed. Few primary care-based programs have been developed, and most have not been well evaluated.

OBJECTIVE. Our goal was to evaluate the efficacy of the Safe Environment for Every Kid model of pediatric primary care in reducing the occurrence of child maltreatment.

METHODS. A randomized trial was conducted from June 2002 to November 2005 in a university-based resident continuity clinic in Baltimore, Maryland. The study population consisted of English-speaking parents of children (0–5 years) brought in for child health supervision. Of the 1118 participants approached, 729 agreed to participate, and 558 of them completed the study protocol. Resident continuity clinics were cluster randomized by day of the week to the model (intervention) or standard care (control) groups. Model care consisted of (1) residents who received special training, (2) the Parent Screening Questionnaire, and (3) a social worker. Risk factors for child maltreatment were identified and addressed by the resident physician and/or social worker. Standard care involved routine pediatric primary care. A subset of the clinic population was sampled for the evaluation. Child maltreatment was measured in 3 ways: (1) child protective services reports using state agency data; (2) medical chart documentation of possible abuse or neglect; and (3) parental report of harsh punishment via the Parent-Child Conflict Tactics scale.

RESULTS. Model care resulted in significantly lower rates of child maltreatment in all the outcome measures: fewer child protective services reports, fewer instances of possible medical neglect documented as treatment nonadherence, fewer children with delayed immunizations, and less harsh punishment reported by parents. One-tailed testing was conducted in accordance with the study hypothesis.

CONCLUSIONS. The Safe Environment for Every Kid (SEEK) model of pediatric primary care seems promising as a practical strategy for helping prevent child maltreatment. Replication and additional evaluation of the model are recommended. *Pediatrics* 2009;123:858–864

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This trial has been registered at www.clinicaltrials.gov (identifier NCT00507299).

Key Words

child abuse, prevention, primary care

Abbreviations

IPV—intimate partner violence

SEEK—Safe Environment for Every Kid

PSQ—Parent Screening Questionnaire

CPS—child protective services

CTSPC—Parent-Child Conflict-Tactics Scale

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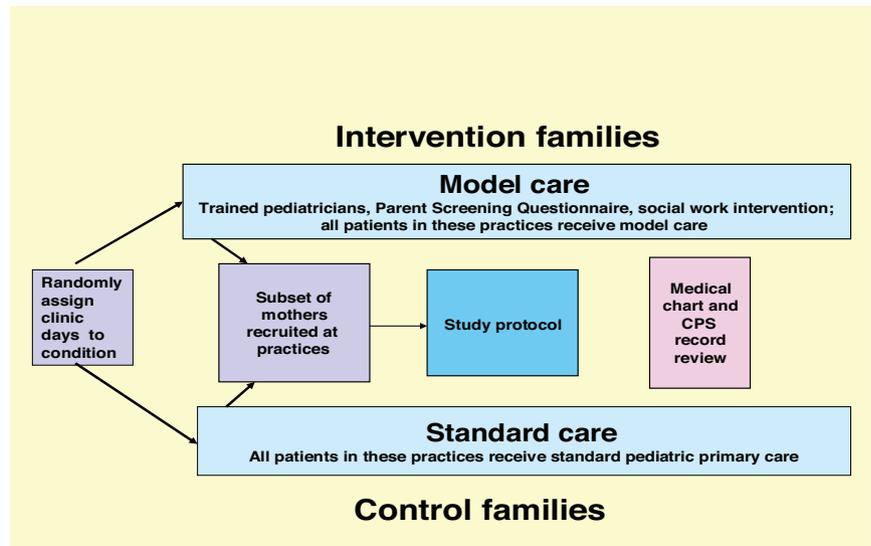
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CHILD MALTREATMENT IS a pervasive public health problem with immense costs to individuals, families, and society.¹ There are many consequences including injuries, neurologic impairment, and sometimes death,^{2–5} psychological disorders, learning difficulties, and conduct disorders.^{2,6,7} Maltreated children are at risk of becoming abusive parents.⁸ Adults victimized as children are at risk for depression, suicide, substance abuse, criminal behavior, interpersonal problems, and academic and vocational difficulties, as well as poor health and increased health care use.^{9–18}

Prevention strategies are needed, particularly in the health care system. Research on preventing maltreatment has focused on secondary and tertiary prevention.^{19,20} Few primary prevention strategies have been evaluated, mostly home visitation programs.^{21–24} The development of preventive interventions remains a national priority.²⁵

FIGURE 1
SEEK study design.



The prevention of maltreatment involves strengthening families and parenting by addressing risk factors that impair healthy functioning. Ecological-developmental theory postulates that rather than any single explanatory factor, there are multiple and interacting contributory problems.^{26,27} Problems such as parental depression, substance abuse, intimate partner violence (IPV), and stress have been linked to maltreatment.²⁸ Pediatric primary care offers an opportunity to help address such risk factors.

The mandate of pediatrics has evolved to include recognizing and addressing psychosocial problems facing many families.²⁹ Despite this development, there has been a modest shift in practice.³⁰ Potential reasons include lack of training, time, screening tools, and discomfort addressing sensitive issues.³¹

We developed the Safe Environment for Every Kid (SEEK) model to enhance pediatric primary care and better address major risk factors for maltreatment. This model includes (1) training residents to address targeted risk factors, (2) the brief Parent Screening Questionnaire (PSQ), and (3) a resident-social worker team to address concerns. The primary hypothesis was that the SEEK model would significantly reduce maltreatment rates.

METHODS

The study design is shown in Fig 1. Two days were randomly assigned to be model-care (intervention) clinics, and another 2 days were randomly assigned to be standard-care (controls) clinics. There was no basis for suspecting a systematic bias in terms of either physicians or families. We implemented the SEEK model in intervention clinics; the control group provided standard pediatric care. We recruited subsets of parents attending the intervention or control clinics to evaluate the model. Participants completed the protocol in our laboratory. We reviewed child protective services (CPS) data and children's medical charts at the end of the study.

Setting and Participants

The study was conducted in a university-based, pediatric primary care resident continuity clinic serving a low-income urban community. All residents were invited to participate; all agreed. Families with primary care physicians in the intervention group received model care, and those with a physician in the control group received standard care. We recruited a subset of parents from each group to evaluate the model. All parents who brought their child (0–5 years) for a health supervision visit received either model or standard care and could participate in the study if they spoke English, did not have another child in the study, and the child was not in foster care. Fig 2 illustrates the sampling and retention.

Thirty-five percent of approached families declined participation. Most stated they were uninterested or had no time. Those in intervention clinics who participated in the study had more problems than those who did not: less food security (30% vs 15%; $P[r] < .01$), more depressed mood (21% vs 11%; $P < .01$), wishing for help

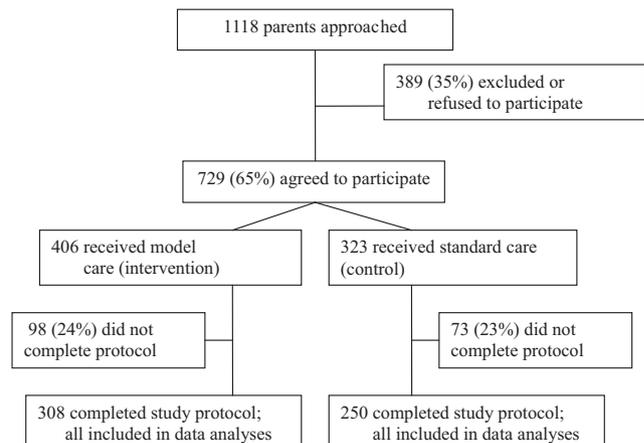


FIGURE 2
Recruitment of study participants.

TABLE 1 Demographic Characteristics of the Intervention and Control Group Families

	Intervention Families (N = 308)	Control Families (N = 250)	P
Child			
Age, median (interquartile range), mo ^{a,b}	6.0 (13)	8.0 (17)	.03
Black, n (%)	285 (93)	234 (94)	.74
Female, n (%)	143 (46)	127 (51)	.30
Parent			
Age, mean (SD), y	25.3 (6.8)	25.3 (7.3)	.94
Caregiver relationship, n (%)			
Mother	287 (93)	231 (92)	.47
Father	13 (4)	15 (6)	
Other	8 (3)	4 (2)	
Marital status, n (%)			
Single	268 (87)	216 (86)	.98
Married	26 (8)	22 (9)	
Separated/divorced/widowed	14 (5)	12 (5)	
Education, n (%)			
<High school	112 (36)	104 (42)	.11
High school or GED	111 (36)	96 (38)	
At least some college	85 (28)	50 (20)	
Employed, n (%)	95 (32)	86 (35)	.47
Family			
No. of children in home, mean (SD)	2.2 (1.4)	2.5 (1.4)	.04
No. of adults in home, mean (SD)	2.2 (1.2)	2.2 (1.1)	.65
Medical Assistance, n (%) ^c	270 (93)	224 (92)	.78

^a The interquartile range is the difference between the third and first quartiles and is a measure of statistical dispersion. Because of the skewed distribution, median and interquartile range are reported.

^b Mann-Whitney U test.

^c Medicaid or State Children's Health Insurance Program.

with child (29% vs 16%; $P < .01$), and injured by a spouse/partner (11% vs 4%; $P < .01$).

Demographic characteristics of the model-care ($N = 308$) and standard-care ($N = 250$) groups are shown in Table 1. The groups were mostly similar. Approximately half the children were male, and most were black. Most parents were mothers, single, and unemployed, with a mean age of 25 years. Families had a mean of 2.2 adults in the home, and most were receiving Medicaid. Intervention-group children, however, were younger, and their families had fewer children. The study sample was similar to the overall clinic population regarding race, health insurance, and most families having single, unemployed mothers.

Procedures

Model care was initiated in 2002. All parents who brought their child (0–5 years) to a resident in a model-care clinic received the intervention. Those who brought their child to clinics on other days received standard primary care. Research assistants approached parents in both the intervention and control clinics to participate in the study. They explained the project and, if the parents were interested, reviewed the informed consent ap-

proved by our institutional review board. Parents were told that the study aimed to help pediatricians help families with problems and that concerns of maltreatment would be referred to the Department of Social Services. Consenting parents were given an appointment to complete the study protocol in our laboratory. The 90-minute protocol included standardized measures on issues such as parent discipline, substance abuse, and depression. Parents were compensated by being given \$55.

Model-Care Intervention

Model care consisted of (1) specially trained residents, (2) resources for the doctors and parents (handouts), (3) the PSQ, and (4) a social worker.

Resident Training

Intervention residents were trained over 2 half-days to address targeted risk factors for maltreatment such as maternal depression, alcohol and substance abuse, IPV, harsh punishment, and major stress. They were taught the relevance of these problems to children's health, as well as how to briefly assess and address them. Additional training or "booster" sessions were conducted every 6 months.

Parent and Physician Resources

Residents received laminated pocket cards with salient information, a handbook with comprehensive practical information including local resources, and user-friendly parent handouts.

The PSQ

The 20-item PSQ was developed to screen for targeted risk factors.³² The PSQ has moderately good sensitivity, specificity, and predictive values.^{32–34} Parents bringing their young children in for health supervision visits to model-care clinics completed the PSQ while waiting. The PSQ has a brief introduction empathizing with the challenges of parenting, expressing an interest in children's health and safety, and an interest in helping.^{32–34} Parents then gave the PSQ to the resident to address identified problems.

The SEEK Social Worker

The intervention clinics had a social worker who worked closely with the residents and families. Residents and parents chose whether to involve the social worker. Management often involved guidance and support in the clinic and referrals to community agencies.

Residents in the control group did not receive the training, did not use the PSQ, and provided standard pediatric primary care. Instead of the study social worker, they had an on-site human services worker with similar responsibilities.

Outcome Measures

Child Abuse and Neglect

Data were obtained from 3 sources: (1) CPS; (2) the child's medical chart; and (3) the Parent-Child Conflict-

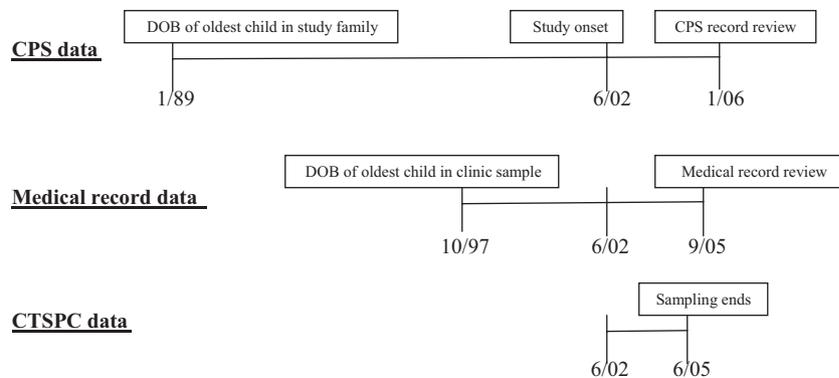


FIGURE 3
Time line for gathering data on the outcome measures. DOB indicates date of birth.

Tactics scale (CTSPC). The time line varied for the 3 measures (Fig 3).

Child Protective Services

CPS records were reviewed to determine each family's possible involvement. CPS reports at the family level rather than for the specific child were considered; the intervention was directed at the family. Most reports were for neglect, often reflecting circumstances involving siblings. We examined whether the groups had had comparable experience with CPS before the study; thus, the preintervention period extended to January 1989 (birth of oldest sibling). The intervention period of observation was from June 1, 2002, to January 31, 2006. We excluded ruled-out reports but combined substantiated and unsubstantiated ones, because research has found few differences between them.³⁵ We did not exclude families with previous CPS involvement. For these families, the study involved tertiary prevention to prevent recurrences. Only 3 reports were made by clinic staff; excluding these reports did not change the results.

Child's Medical Chart

The children's clinic records were reviewed by a medical student. She was not blinded because PSQs were in some records. However, she did not judge situations; she recorded what doctors documented. All uncertainties in coding were resolved with a study pediatrician. Abstracted information included nonadherence, delayed immunizations, injuries, and ingestions (construed as potential markers of neglect).³⁶ We also noted physical or sexual abuse and neglect and CPS reports.

Parent-Child Conflict Tactics Scale (CTSPC)

The CTSPC³⁷ includes 22 acts of discipline and punishment. CTSPC data were obtained during the sampling period of June 2002 through June 2005. Nearly all intervention families had received some model care before the initial study protocol (mean: 2.8 visits); thus, we used these data to measure the intervention's impact on parental discipline. Parents were asked how often they conducted each act (ever and in the past year). There were 5 subscales: nonviolent discipline, psychological aggression, corporal punishment (minor violence), severe, and very severe physical assault. "Hit him or her

with a fist or kicked him or her hard" represents "severe violence," and "Beat him or her up, that is, you hit him or her over and over as hard as you could" indicates "very severe violence." The reliability for the overall physical assault scale was adequate (α coefficient = .55); there is evidence supporting its validity.³⁷ There were few very severe assaults, so they were combined with severe assaults. The measure includes the frequency of behaviors.

Physician Outcomes

We measured the influence of the physician training on their attitudes, knowledge, perceived competence, comfort level, and practice behavior via a physician questionnaire completed before the study and after 6 and 18 months. We also assessed the extent to which the targeted problems were identified and addressed via the medical chart review.

Data Analysis

Demographic characteristics were analyzed by using χ^2 , t , and Mann-Whitney U tests. Comparing demographic characteristics (Table 1) revealed that the child's age and number of children in the home differed significantly between groups. Logistic regression was used for dichotomous outcomes and to compare the rates of problems. In the latter analysis, only the number of children in the home was controlled for; the child's age at the time these data were gathered did not differ.

Multiple regression analysis was used for continuous outcomes, examining the effect of the intervention on the CTSPC data, controlling for child's age and number of children in the home. Control variables were entered first, then the group variable (intervention or control). After the logistic and multiple regressions, 1-tailed t tests examined whether the intervention resulted in less maltreatment. One-tailed testing is appropriate given the study hypothesis and that there is no or little basis for anticipating that the SEEK model intervention would increase the rate of maltreatment.

RESULTS

The SEEK model was associated with diminished child abuse and neglect, measured 3 different ways. After onset of the SEEK intervention, there were fewer CPS

TABLE 2 Frequency Rates of Families With at Least 1 CPS Report and Odds Ratios, Controlling for Number of Children^a

Time Period	Families With at Least 1 CPS Report, n (%)		χ^2 P	Odds Ratio	Odds Ratio P
	Intervention (N = 308)	Control (N = 250)			
Jan 1, 1989, to Jun 9, 2002	38 (12.3)	30 (12.0)	.45	0.9	.35
Jun 10, 2002, to Jan 31, 2006	41 (13.3)	48 (19.2)	.03	1.5	.045

^a Results are from 1-tailed testing for significance.

reports among intervention families (13.3% vs 19.2%; $P = .03$) (Table 2). Before the study, 12% in both groups had CPS involvement. Of 248 reports, 69% were for neglect, 21% for physical abuse, and 6% for sexual abuse. Of 239 reports with outcome data, 56% were substantiated, 43% were unsubstantiated, and 2% were ruled out. Logistic regression analysis indicated that having more children in the home increased the probability of a CPS report. Thus, we compared the groups while controlling for the number of children. The control group was 1.5 times more likely to have had at least 1 CPS report (Table 2).

On review of the medical charts, the intervention group had fewer problems related to possible neglect after the study onset compared with controls. There were fewer instances of nonadherence to medical care (4.6% vs 8.4%; $P = .05$) and delayed immunizations (3.3% vs 9.6%; $P = .002$).

Intervention-group parents reported fewer instances of severe or very severe physical assault than did control-group parents (average weighted score: 0.11 vs 0.33; $P = .04$) (Table 3). For example, 6 control parents reported having “hit with a fist or kicked” their child compared with just 1 parent in the intervention group.

DISCUSSION

This study provides promising evidence that the SEEK model of enhanced pediatric primary care can reduce the

TABLE 3 Group (Intervention Versus Control) Effect on the CTSPC, Controlling for Age and Number of Children in the Home

	Intervention (N = 308), Mean (SD) ^a	Control (N = 250), Mean (SD) ^a	P
CTSPC subscales ^b			
Nonviolent discipline	19.5 (28.2)	21.8 (28.4)	.49
Psychological aggression	7.5 (14.9)	9.1 (16.4)	.41
Physical assault (minor)	3.5 (8.3)	5.0 (12.4)	.17
Physical assault severe or very severe	0.11 (0.75)	0.33 (1.96)	.04

Results are from 1-tailed testing for significance.

^a Sample size for scales vary slightly because of missing values.

^b CTSPC scores were weighted as follows: 1 = if respondent answered that they had done the item to them once in the past year or that the behavior had happened, but not in the past year; 2 = twice in the past year; 4 = 3 to 5 times in the past year; 8 = 6 to 10 times in the past year; 15 = 11 to 20 times in the past year; 25 = >20 times in the past year.

rates of child abuse and neglect in a low-income urban population. There were 31% fewer CPS reports among intervention-group families compared with controls. Our findings are supported by data from 2 additional sources: parents' self-reports and the children's medical charts. These results together suggest a promising new strategy for preventing child maltreatment at primary, secondary, and tertiary levels.

Four additional considerations are worth noting. First, it was difficult to avoid some diffusion of the model to the control group. At times, residents switched a clinic day or parents were erroneously given an appointment for the wrong day. Residents were asked not to discuss the SEEK model with colleagues, but some diffusion of knowledge probably occurred. Second, before the study, the clinic had a human services worker providing social work-related services. Thus, the incremental difference of having the study social worker could be small. Third, surveillance bias is a common problem and could lead to increased detection of the outcome. All of these issues would bias our results, diminishing the differences between groups. Fourth, we have applied a conservative “intention-to-treat” analysis, including participants regardless of how much of the intervention they received. Some received little of the SEEK model, if for example, staff forgot to give them the PSQ or the parent did not manage to complete it. Given these considerations, our findings are remarkable.

Few other interventions for preventing maltreatment have been found to be similarly effective. Nurse home visitation has been found to reduce maltreatment in some communities.²⁴ Although promising, it cannot be implemented easily within the current health care system. Newborn nursery-based abusive head trauma prevention programs may also be effective, but such programs focus primarily on infants and do not address other forms of maltreatment.⁵

How might a limited intervention such as the SEEK model prevent child maltreatment? There are other studies that have shown brief interventions influencing parenting behavior and children's development.³⁸ In considering possible mechanisms, we examined “process” measures. The physician training was quite effective. After 18 months, residents in the intervention group reported greater comfort addressing targeted problems (mean: 3.9 vs 3.5 [SD: 1.1]; $P < .01$), sense of competence (mean: 3.8 vs 3.3 [SD: 0.07]; $P < .01$), and involvement addressing these problems (mean: 3.9 vs 3.7 [SD: 0.08]; $P = .02$). The improved capabilities of the physicians likely played an important role in reducing the rates of child maltreatment.

All targeted problems were more likely to be screened for in the intervention group compared with controls. Comparing the screening rates before the study to those after it began, intervention-group rates increased by 20% to 25%, and control-group rates increased by only 3% to 10%. For example, before the study, 5% of parents in both groups were screened for maternal depression. After the study began, parents in the intervention group were screened 32% of the time while the control-group rate remained unchanged ($P < .001$). Conse-

quently, 76 parents in the intervention group were identified with possible depression compared with 15 controls.

The 31% reduction in CPS reports (13.3% vs 19.2%) is striking, suggesting that for every 17 children receiving the SEEK model of pediatric primary care, 1 case of abuse or neglect can be prevented. Such a reduction could have far-reaching ramifications given the prevalence of maltreatment. The preintervention rates of CPS involvement were similar in both groups. One cannot simply compare those rates to those after the intervention began. The observation periods were not of equal duration, and changes in CPS policies may have been influential.

The SEEK model was evaluated in a resident continuity clinic. There is interest in instilling a broad view of child health into the resident experience.³⁹ The approach offered by the SEEK model fits well. Although there are logistic challenges to implementing this model in a resident clinic, there are substantial advantages. This is an important formative phase, and residents may be especially open to new ideas compared with practicing physicians. In addition, residents are a captive audience and generally attend required conferences. We are currently replicating this model with pediatricians in private practices to determine its efficacy in that setting.

There is mounting interest in modifying pediatric primary care to respond better to the needs of children and families.^{40–43} The SEEK model adds a promising approach. It is a relatively modest enhancement of good pediatric practice. Indeed, much of what was incorporated, such as screening for IPV, has been recommended by the American Academy of Pediatrics.⁴⁴ Hiring a social worker may not be feasible or cost-effective for many pediatric practices. Many clinics that serve low-income families, however, do have a social worker. We were careful to develop an approach that would be focused and require limited time. The assessment of problems aimed to clarify only a few key issues. The management was guided by parent's interest, and the physician's role was limited but pivotal, offering reassurance or facilitating additional help.

Study Limitations

The study was conducted in 1 university-based resident continuity clinic that serves a low-income urban population. The sample was relatively small but had adequate power to detect moderate-sized effects. Caution is needed before generalizing the findings to different populations; replication of the SEEK model is warranted.

As with many studies involving low income, minority, and inner city residents, recruitment and retention of participants was challenging. A fair number of parents declined participation. In addition, ~23% of participants who consented missed their appointment to complete the laboratory protocol. To assess potential recruitment bias, we examined differences between parents who agreed to participate and those who refused. In the intervention group, parents who agreed to participate reported more problems on the PSQ than those who declined. This suggests that our findings pertain to fam-

ilies with more problems and at relatively high risk for maltreatment. However, because 23% of the parents did not complete the protocol, it is possible that those at highest risk may have been more likely to be missed.

Finally, the absolute numbers of maltreating families may seem low. On the other hand, a difference of 6% in the rate of CPS involvement is hardly trivial. Similarly, relatively few families reported severe violence. The small but significant difference reported by parents themselves is also not trivial. Although maltreatment is an important problem, base rates in the community are relatively low. This poses a challenge for prevention studies to detect significant effects.

CONCLUSIONS

This study reveals promising evidence that a modest but innovative pediatric primary care-based intervention can help prevent child maltreatment. Clearly, the SEEK model needs to be replicated to determine program efficacy in other settings. Additional research should also examine a broader range of outcomes and the underlying mechanisms leading to program effectiveness.

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