

Clinic-Based Intervention to Promote Literacy

A Pilot Study

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● Educational research has shown that children become literate more easily if their parents read to them. A clinic-based program was designed to encourage early book use among parents of children at risk. It included (1) waiting room readers, (2) guidance about literacy development, and (3) provision of children's books at each visit. Seventy-nine parents of children aged 6 to 60 months were interviewed. Parents who had previously received a book were more likely to report looking at books with their children or that looking at books was a favorite activity (adjusted odds ratio, 4.05). This association was strongest among parents receiving Aid to Families With Dependent Children (odds ratio, 7.8). This preliminary study suggests that pediatricians can play a role in enriching children's early literacy environments, especially for children at high risk of school failure.

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Reading failure disproportionately affects children from socially disadvantaged homes and contributes to the propagation of the cycle of poverty.¹ Pediatricians have a special opportunity to encourage behaviors that improve the child's chances to become literate. Parents come to the clinic regularly throughout their children's early years, and they expect to receive guidance that is important to the well-being of their children. Guidance from the pediatrician occurs within the context of a personal relationship and can be tailored to the individual child and family.

Current research on literacy acquisition assigns a critical role to the child's early literacy environment. Young children learn about the form and function of written language through daily exposure to print mediated by their parents or other adults. The quality of these early experiences affects the child's ability to profit from formal reading instruction once in school.² Thus, interventions that enhance the child's early exposure to literacy may increase the chances of reading success, even in the face of other risk factors associated with poverty.

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While a variety of experiences contribute to the preschool child's emerging literacy, there is consensus among researchers that exposure to children's books is particularly important.³⁻⁷ Children who are read to learn that printed words convey information they want to know. This realization motivates them to master reading, a task that, by nature, is repetitious and often frustrating.⁸ Book sharing routines also familiarize children with the question-and-answer format prevalent in elementary schools, smoothing the transition from home-based to school-based learning.⁹

For infants and toddlers as well as preschool children, books provide a context for language and cognitive developments related to literacy acquisition and school success. Rhythmic speaking and holding enhance infant attention.¹⁰ Parents are more responsive to their children's utterances while looking at books together than during free play or play with a toy.¹¹ With repeated "reading," increasingly complex language routines develop, from the simple labeling of objects to descriptions of events to the child's creation of fictions about his or her own experiences relating to the book.¹²⁻¹⁴ As a group, children from underprivileged homes experience fewer of these important book-sharing interactions than do their more advantaged peers.^{2,7} Because of the benefits of early book sharing and the special potential for parent education in the pediatric clinic, we implemented a program in the Pediatric Primary Care Clinic at Boston (Mass) City

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Purpose.—This department is intended to share information concerning educational efforts in the broad field of pediatrics. We welcome studies on the following topics: undergraduate and graduate education in medicine and allied health occupations; continuing education of health professionals; education of patients and families; and health education for the general public, the community, and organizations that contribute to the promotion and improvement of the health of children.

Editorial Comment.—Promotion of literacy is an important national issue, but how can pediatricians be effective in this effort? Needlman et al present a clinic-based program that offers us suggestions that worked. See if you can apply this to your practice.—H.D.A.

Characteristic	% of Patients
Gender of child	
M	48
Childs age, mo	
6-12	41
>12-24	32
>24-60	28
Parents' country of origin	
United States	49
Haiti	17
Puerto Rico	10
Other	24
Parents' educational level (n = 76)*	
0-8th grade	5
9-11th grade	20
High school graduate	40
Post-high school	36
Government support (n = 77)*	
AFDC	39
No AFDC	61
Marital status (n = 62)*	
Single	40

*Patient numbers are less than 79 due to missing data. AFDC indicates Aid to Families With Dependent Children.

Hospital to promote literacy development by encouraging parent-child book sharing.

The purpose of this pilot study was to assess parental response to the clinic-based literacy program. We hypothesized that exposure to the literacy program would be associated with increased book use by the parents and children.

SUBJECTS AND METHODS

Intervention

The clinic-based literacy program began in March 1989. The program included three components: (1) volunteers who read aloud to children in the waiting room, (2) counseling by the pediatrician about literacy development, and (3) book distribution. The program was designed so that a child would spend time with the reader in the waiting room and then move to the examination room where parent education about literacy development and a free book would be delivered together as part of anticipatory guidance.

Volunteers from the hospital and surrounding community underwent a 1-hour training session that focused on flexibility in approaching children of different ages and interests (eg, not always sticking to the printed text as well as encouraging participation) and supporting positive parental responses (eg, commenting on the child's level of interest). In practice, the content of the reading sessions varied depending on the particular reader, child, and level of activity in the waiting room.

Pediatricians, residents, and nurse-practitioners were trained via a combination of lectures on literacy development and workshops. The workshops focused on ways to support parents' appropriate desire to perceive their children as "smart" without encouraging undue pressure to "learn to read" too early. No set content for the anticipatory guidance was established, and in practice the counseling varied depending on the particular practitioner and family.

A selection of developmentally and ethnically appropriate books was obtained in sufficient quantity that every child from 6 months through 6 years of age could take home a free book after each visit. A stock of books was kept in the clinic for pediatricians to distribute to their patients.

Subjects

Between January and April 1990, parents bringing their children to the Boston City Hospital Pediatric Primary Care Center for routine care were recruited for the study. Parents present in the waiting room during the hours that the interviewer worked were asked to participate. Parents who were conversant in either English or Spanish and whose children were between the ages of 6 and 60 months

were included in the study. Parents were excluded if the children were acutely ill or had not received routine care in the clinic within the past 6 months. Few parents who met the study criteria refused to participate; however, no record of refusals was kept.

Survey Design

The study employed a 15-minute structured interview administered by a research assistant who was not otherwise associated with the literacy program. Respondents consented to answer a series of questions about how their child "spends his/her time." They were not told at the outset that the focus of the questions was literacy, although this was made clear after information regarding the principal outcome had been elicited. The study was approved by the Boston City Hospital Human Investigations Committee.

After demographic data were obtained, parents were asked to provide a 24-hour "activity recall," modeled after a 24-hour diet recall, including everything they did with their child during that period. To increase the recall of details, the day was broken down into three periods: waking to lunch, lunch to dinner, and dinner to bedtime. If parents responded "We played," they were asked to describe what they actually did. Parents were then asked what their child's three favorite activities were, excluding eating and sleeping. These questions were presented in an open-ended format and at a point in the interview when no mention had yet been made of books or reading. Thus, the parents' responses were not likely to have been biased by any tendency to give answers they thought were desirable or expected. "Literacy orientation" was scored as positive if the parent mentioned looking at books or magazines with the child during the past 24 hours or included looking at books among the child's three favorite activities. This measure was designed to reflect parent-and-child behaviors believed to be particularly literacy-promoting and to be least subject to reporting bias.

After these open-ended questions, parents were asked specific questions regarding their use of books with their child and the number of books in the home. Parental reading habits and a history of having been read to during childhood were then assessed. As a way of gauging parental literacy, parents were asked to choose which one of three statements best described their reading ability: (1) "I can read anything easily." (2) "I can read enough to get by." (3) "Reading is difficult for me."

Finally, parents were asked to recall whether during previous visits they had seen the volunteer readers, had spoken with their pediatrician or nurse-practitioner about books or reading, or had been given a free book by their pediatrician or nurse practitioner. Parental report of exposure to each of these components of the literacy program constituted the independent variables for the study. As noted, the actual content of the waiting room reading experience and anticipatory guidance varied depending on the reader, pediatric provider, and family.

Analysis

Because the study was designed to evaluate an ongoing program, we were unable to assign subjects randomly to an intervention or nonintervention group. Instead, we compared parents who reported prior exposure to each of the components of the literacy program with those who denied such exposure. Characteristics of exposed and nonexposed parents were compared to determine whether they were similar. In form, this was a nested case-control design.

Literacy orientation, defined above, was the dependent variable used in both bivariate (unadjusted) and multivariate (adjusted) analyses. χ^2 Tests were used in the bivariate analyses. $P < .05$ was considered statistically significant. A logistic regression analysis (SAS computer program) was used to assess adjusted relationships for the dichotomous outcome. Odds ratios and 95% confidence intervals were calculated from these analyses.¹⁵

RESULTS

Seventy-nine parents participated in the study. Demographic characteristics of the sample appear in Table 1. Thirty-eight percent (30/79) reported having seen a volunteer reader in the waiting room during a previous visit;

Program Component	% Reporting Literacy Orientation
Saw waiting-room reader (n = 78)*	
Yes	40
No	42
	<i>P</i> = .9
Guidance on literacy development (n = 76)*	
Yes	43
No	42
	<i>P</i> = .9
Received book (n = 77)*	
Yes	53
No	32
	<i>P</i> = .06†

*Patient numbers are less than 79 due to missing data.
†Odds ratio, 2.4; 95% confidence interval, 0.95 to 6.1.

27% (21/79) reported having talked with their pediatrician about literacy development; and 46% (36/79) had been given one or more books by their pediatrician. Although the program was designed to incorporate readers, anticipatory guidance, and books, only 6% (5/79) reported having been exposed to all three components of the program. Therefore, each component was considered separately. Parents exposed to the readers, anticipatory guidance, or books did not differ from unexposed parents in any of the following characteristics: child's gender, child's age, parent's country of origin, parent's educational level, government support, or marital status.

Bivariate analyses showed no statistically significant relationships between literacy orientation and exposure to any of the three components of the program, taken singly or in combination. Trends linking exposure to the readers or anticipatory guidance were not evident; therefore, these program components were omitted from subsequent analyses. There was, however, an association between literacy orientation and having been given a book at a previous visit that approached statistical significance (Table 2). Further exploration of this one component (books) was performed.

To assess the independent effect of having been given a book and to control for possible confounding variables, a logistic regression procedure was performed, which included the following: age of the child, parental ethnicity, parental educational level, parental reading habits, government support (whether receiving Aid to Families With Dependent Children [AFDC]), and whether the child had been given a book by their pediatrician. In this model, having been given a book was associated with literacy orientation ($\beta = 1.40$; odds ratio, 4.05; $P = .028$; 95% confidence interval, 1.12 to 14.6). This finding shows that parents who were given books were approximately four times more likely to report literacy orientation than parents who did not receive books, when other factors were controlled for. The fact that the odds ratio increased from 2.4 in the unadjusted analysis (Table 2) to 4.05 in the adjusted analysis indicates the effect of uncontrolled confounders in the unadjusted analysis.

Given the diversity of the sample, further analyses were performed to investigate whether receiving books had a positive effect for a specific subgroup of parents. Three factors were chosen as likely to influence parental response to the intervention: whether the family received AFDC (used as a proxy for income), parental education, and the child's age. Stratified analyses were performed for each of these variables.

Stratification by income revealed a strong effect (Table

Variable	% Reporting Literacy Orientation
Parents receiving AFDC (n = 30)	
Received book	
Yes (n = 14)	64
No (n = 16)	19
	<i>P</i> = .011 (odds ratio, 7.8)†
Parents not receiving AFDC (n = 47)	
Received book	
Yes (n = 22)	46
No (n = 25)	40
	<i>P</i> = .7 (odds ratio, 1.25)

*AFDC indicates Aid to Families With Dependent Children.
†Confidence interval, 1.48 to 41.2.

3). Among parents receiving AFDC, 64% of those who had been given books reported literacy orientation compared with 19% of those who had not been given books ($P = .011$). Among parents not receiving AFDC, literacy orientation was not significantly different between parents who had or had not been given books (46% vs 40%, $P = .7$). Stratification by parent's education or child's age did not result in significant associations between literacy orientation and having been given a book.

COMMENT

The main finding of our study is that parents who had been given a children's book during a previous visit were approximately four times more likely to report positive literacy orientation, after controlling for confounding factors. This result supports the contention that a simple, inexpensive, clinic-based intervention can lead to positive changes in the home literacy environment, as reported by parents. Such changes may result in increased success in acquiring reading skills in early elementary school. It is encouraging that the benefits of the intervention were especially apparent among families at highest risk for reading failure, ie, those receiving AFDC.

Our findings are consistent with the single other published evaluation of a clinic-based literacy program. In Pittsburgh, the percentage of parents who reported daily reading with their child rose from 47% to 69% 6 months after having been given a packet of books and information by a volunteer in the clinic. However, details of sample selection and data collection were not reported.¹⁶

Several potential sources of error need to be considered in interpreting our findings. First, although the interviewer attempted to enroll all eligible parents, it is possible that parents less responsive to the intervention were missed with greater frequency. This bias would have led to overestimation of intervention effects.

Second, the study relied on parental self-reporting, raising the possibility that observed differences may have reflected parental perceptions or priorities rather than their actual behavior. The possibility of biases introduced because of systematic differences in reporting between groups of parents cannot be excluded. However, information for the principal dependent variable was obtained by spontaneous recall, without the parent knowing the specific purpose of the question.

Third, the fact that patients were not randomized increases the chance that observed associations resulted from confounding. Although several factors likely to be

confounders were included in the logistic regression model, we cannot exclude confounding by unmeasured factors. For example, parents who were more highly motivated to provide literacy stimulation for their children might also have been more vocal in requesting books, which could explain the apparent association between taking home a book and literacy orientation; however, it cannot easily account for the large increase in literacy orientation associated with taking home a book among parents receiving AFDC compared with the negligible increase among parents not receiving AFDC.

Finally, small sample size may have resulted in type II errors in the stratified analyses. It is possible that with larger sample sizes, additional subgroups of parents who responded positively to the program would be identified.

While the present study suggests a positive effect of book distribution on the reported frequency of literacy orientation, similar effects were not found for the volunteer readers or the anticipatory guidance. Parents' ability to remember having seen a volunteer or having spoken about reading with their pediatrician may be more subject to recall bias than whether they were given a book to take home. Some parents may have been affected by the modeling or counseling but may have failed to report the exposures. Another explanation may be that modeling and anticipatory guidance influence the quality of the parent-child book interaction more than they do its quantity. Qualitative aspects of early literacy interactions have been shown to differ between social classes,¹⁷ and such differences may be more important than the mere quantity of book use.

It may be that for the poorest children, the lack of books poses the greatest barrier to literacy-promoting experiences. By supplying books in those homes, we may have been not only communicating the importance of book sharing to parents but also providing them with the means to act on the information. Informal discussions with parents indicate that the books often provided a vehicle for the child to secure parental attention: "He's always bringing me a book to read for him." The fact that the books were given by the pediatrician or nurse practitioner was meaningful to some parents: "Every time I brought her to the clinic, the doctor gave us a book, so I figured he must want me to do something with them."

Future Research

Further work needs to be done to confirm these findings. Future evaluations of clinic-based literacy programs should include randomized, controlled trials employing standardized modeling and pediatric guidance, observation of the parent-child book interaction before and after the intervention, and testing of the child's verbal and written language skills. It will be necessary to follow a group of intervention and control children longitudinally to discover whether early pediatric intervention can indeed affect elementary school performance for children at risk. One published study suggested that preschoolers who are given books do indeed perform better in first grade.⁷

Implications

This preliminary study suggests that the pediatric primary care clinic can serve as an effective site for interventions to enrich children's early literacy development, particularly for those children at greatest risk for school failure. Pediatricians can develop such programs themselves or invite community literacy groups to provide the services and books in the clinic. Medical-educational col-

laborative programs are more likely to meet the needs of children than is either type of intervention alone. Specific support for literacy development may complement other efforts by pediatricians to combat the biologic and social risk factors for school failure.¹⁸

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