A pediatric clinic-based approach to early literacy promotion - experience in a well-baby clinic in Taiwan

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Background/Purpose: Reach Out and Read (ROR) is an evidence-based intervention situated in pediatric offices and can help pediatricians to promote parents’ reading to their children. The objective of this study was to determine if the program could also achieve good results in different culture, such as in Taiwan.

Methods: The intervention group (n = 205) was enrolled from a well-baby clinic participated in a program modified from ROR (receiving anticipatory guidance and an appropriate children’s book at a well-baby clinic) at a mean age of 9 months. The control group (n = 210) was recruited from a general pediatric outpatient service at the compatible age. Both groups were queried about the reading habits of primary caregivers and the frequency of book sharing with their child. When children were at aged 12 to 18 month, follow-up questionnaires were collected.

Results: At follow-up, ANCOVA analysis indicated that the intervention group exhibited significantly greater increase in child-centered literacy scores (frequency of shared reading, reading as one of their three favorite interaction activities and child interested in shared reading). Caregivers were willing to accept their pediatrician’s advice to read to their infants.

Conclusion: In this study, the simple intervention, implemented at a well-baby clinic in Taiwan, changed Taiwanese parents’ attitudes toward the importance of reading with their infants and toddlers. As primary health care providers, pediatricians are in a unique position to affect and encourage parental behaviors that foster early literacy development in children.

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Introduction

Children's literacy is an important aspect in the pediatric well-baby clinic. Literacy promotion by pediatricians has become a big part of pediatric clinic practice in the U.S.A. since 1989, when a group of pediatricians and early childhood educators started an early literacy promotion program, Reach Out and Read (ROR). Briefly, ROR is a nonprofit program endorsed by the American Academy of Pediatrics (AAP). The model is a straightforward 3-component system that plans to use primary pediatric clinics to promote early literacy skills in children from aged 6 months to 5 years: 1) waiting room program (book-corner and volunteers who read to the children); 2) anticipatory guidance about literacy development; and 3) distribution of age-appropriate children's books at each clinic. The mission of ROR is to make literacy promotion a standard part of pediatric primary care, so that children who come to such pediatric clinics could grow up with books and have a love for reading.

Language development is fundamental to emergent literacy, and has been proven to provide a critical component of the foundation for reading skills and success in school. However, many parents do not realize the importance of family literacy activities as they relate to children’s language in the first years of life when rapid brain growth occurs. Researchers have pointed out that when different activities such as playtime, mealtime, dressing, and reading were compared, the greatest quantity and quality of language interaction occurred during parent-child reading activities. Since Needlman's pilot study showed that parents who had been given books and guidance at pediatric primary care clinics were four times more likely to report reading aloud with their children, evidence of the efficacy of ROR has appeared in numerous peer-reviewed articles. Such research clearly demonstrates that this type of pediatric intervention can significantly enhance a young child's early literacy environment by increasing the frequency of parent-child book-sharing activities and changing parental attitudes toward reading aloud, facilitating child's home literacy environment, as well as improving the language scores of young children. Indeed, researchers have noticed that reading aloud to children is the single most important parental activity to prepare children to succeed in learning to read. Meanwhile, after a 20-year expansion of this program from a single clinic, ROR still appears to be effective for children from a variety of backgrounds, including those with high-risk factors or in bilingual immigrant families. These studies also supported that pediatricians could play a role in enriching children's early literacy environments.

ROR has been proven to bring other benefits beyond literacy. From the view of parenting, it appears that reading together may reduce parenting stress and reflect the security of the emotional attachment. And from the anticipatory guidance given by the pediatrician, parents learn to avoid unnecessary power struggles during reading aloud which lets parents realize that compromising with a child can make parts of the day more enjoyable for both them and children. From a medical point-of-view, sharing a book with young children during a painful and frightening procedure, such as intravenous accesses, blood sampling, or ultrasonic examination, can often relieve the anxiety children feel. Meanwhile, when talking about children's books or stories with parents, pediatricians receive particularly warm smiles and thanks from parents and children; such responses have contributed to the acceptance of ROR.

The abovementioned studies and benefits are mainly proposed from the U.S.A., where parents value storybook reading as a medium of entertainment for family literacy activities. They view reading together as a special time to share and bond with their children, and children’s books are available in the home. However, in Chinese society, although Chinese parents value their children’s education and learning very highly, shared reading is not a culturally practiced activity. Wu reported that a majority of parents in southern Taiwan did not set a definite time for reading stories to their preschool children, and there were also few literacy resources at home. Taiwan's Ministry of Education has applied positive findings about reading from western research and initiated a program called the National Children’s Reading Movement in 2000. Researchers have examined the impact of the program on children’s reading achievements, and they found that the reading involvement of elementary students was significantly correlated with home variables (e.g., positive home atmosphere, parental expectations, habit of reading at home, home location). However, the main subjects of above activities were focus on elementary students and their families. There were few activities designed for preschoolers, especially for infants or toddlers, and little is known about shared reading with young infants in Taiwanese families. Faced with the good results from the clinic-based intervention program, the aim of this study was to conduct the ROR program in a pediatric well-baby clinic, and to examine if these effects could also be introduced to parents by pediatricians in Taiwan.

Methods

From January to December 2007, families routinely attending a well-baby clinic at Lotung St Mary’s Hospital were approached in the waiting room and asked to participate in the intervention group. Families were eligible when: (1) those who accompanied the child to the clinic were the primary caregiver; and (2) the child was aged between 4 and 16 months at the time of the enrollment interview. We did not intend to exclude special children, such as those with congenital anomalies, because we believe that shared-book reading should be initiated by the parents’ motivation; however, those children enrolled in this study were all at a normal developmental range. Due to the waiting room program (book-corner and volunteers reading to the children), we could not enroll control group participants from the same well-baby clinic. Thus families in the control group were recruited from our general pediatric clinic at an age compatible to the intervention group. Subject groups were divided up according to children’s age: children younger than 12 months were placed in the infant group, while those aged 12 to 16 months were placed in the toddler group. Second
follow-up was at the 12 and 18 month vaccinations for each group, respectively.

**Study design/intervention**

At enrollment and at each later well-baby clinic (4-18 month scheduled vaccination), the intervention program was conducted including three components: (1) volunteers who read aloud to children in the waiting room, and helping families to complete the questionnaire; (2) an age-appropriate book distribution at clinic; and (3) literacy anticipatory guidance and handout counseling by the pediatrician. Caregivers were informed about the study design in the waiting room. After obtaining informed consent, caregivers were asked to fill out a questionnaire, which took about 10 minutes. If the caregivers were unable to read the questionnaire by themselves, a volunteer in the waiting room would help families by reading these items to them. At the second follow-up, families were asked to complete the questionnaire again. Participants in control group also were asked to complete two set of questionnaires but received no anticipatory guidance and books.

The books chosen were developmentally appropriate, and underlying the concept that caregivers would enjoy sharing books that included abundant pictures and few words that could be used by caregivers who were comfortable reading and those who were not. The handouts consisted of double-sided pages that briefly introduced the benefits of reading to infants, and focused on interactions between the caregiver and the child, also including suggestions about simple strategies.

Items in the questionnaire included: (1) demographic information; (2) literacy variables including adult literacy (caregiver’s reported reading habit, education level); and (3) home literacy (frequency of book sharing, reading as one of the three favorite interaction activities). The summation scores of frequency of book-sharing, children’s interest in book-sharing and reading as one of the three favorite interaction activities was coded as child-centered literacy score (CCLS) for evaluating the effect of intervention. Factors that competed with reading habits such as television viewing were also recorded.

**Statistical analysis**

Data were analyzed using SPSS software, Version 12. Frequency counts of categorical variables provided descriptive information about the sample. Two-tailed t tests on continuous data and $\chi^2$ test on dichotomous variables were used to compare the groups. An ANCOVA was conducted comparing the two groups with respect to pre-intervention and post-intervention changes to the CCLS with baseline CCLS as covariate.

**Results**

During the study period, 205 families participated in the intervention group at the well-baby clinic, and 210 families were in the control group. The demographic characteristics of intervention and control families are presented in Table 1. There were no significant differences with respect to the demographic variables. At enrollment, when all children were on average aged approximately 9 months, literacy characteristics were virtually identical in both groups at baseline data (Table 1). Seventy percent of caregivers reported reading habits (including magazines and newspapers), but about half read only 1 to 2 hours in a week. There was a trend that as the primary caregiver’s education increased, so did the frequency of reading together: college-educated caregivers were 51% more likely reading together (≥ 3 d/wk) compared with those who had been educated for 12 years (40%) or 9 years (15%).

At follow-up, when all children were aged on average 15 months, the effect of intervention was assessed by the CCLS from the parent’s reports. The t test demonstrated a significant difference between intervention and control group in CCLS ($t = -5.78, p < 0.001$). ANCOVA tests were further conducted to test whether the presence or absence of intervention predicted the later CCLS. The findings indicated that, after controlling the baseline CCLS, children’s gender, caregiver’s reading habit, and education, the intervention group still exhibited a significant increase in child-centered literacy compared to the control group ($F = 33.427, p < 0.001$). Fig. 1 presents the significant intervention effect and literacy-related variables after intervention are shown in Table 2.

**Discussion**

In our study, CCLS (frequency of book-sharing, children’s interest in book-sharing, and reading as one of the three favorite interaction activities) showed a significant increase due to the intervention, which indicated that caregivers were willing to accept a pediatrician’s advice to read to their infants. The results of this study added to a growing body of evidence supporting the impact of ROR on child home literacy, but these results were developed at an eastern country with different culture and reading belief as compared with western society. As far as we know, our clinic-based ROR program in Taiwan is the first of its kind developed in an eastern society.

Home literacy environment influences a child’s literacy development$^{20,21,26}$ and the influenced factors included children’s books, frequency of library clinics, caregivers reading habit, reading together, and frequency of one literacy-competitive behavior (television viewing). The AAP
has recommended that pediatricians advise parents to avoid television-viewing entirely for children younger than 2 years and to limit the viewing time of older children to no more than 2 hours a day, and encourage more interactive activities that will promote proper brain development, such as talking, playing, singing, and reading together. There are reasons to believe that the effects of media exposure on children’s development are more likely to be adverse before the age of about 30 months than afterwards. In our study, 72% children younger than 2 years were outside the AAP’s guideline. This is indeed an issue that should be discussed further.

Although shared-book reading is not a culturally common home activity in Chinese families, under the influence of Western education philosophy and practices, there are increasing numbers of programs and groups that promote shared-book reading. Since 2006, an international project called Bookstart, which came from England and promotes shared reading starting from infancy, was introduced into Taiwan by Hsin-Yi Foundation. The project has been implemented at some local public libraries. Nevertheless, there were no further studies about the long-term implications on the reading attitude of our young children’s parents who were involved in the project, and the project needed the coordination of local governments and public libraries. In addition, public libraries or experienced children’s librarians were not usually available in some rural or secluded areas. In contrast, due to our vaccination policy, every preschooler will routinely be brought to a pediatrician or a general physician for well-baby clinic, and general physician clinics or public health clinics were more convenient in many places compared to public libraries in

![Figure 1](image_url)

**Figure 1** The effect of pre-and post-intervention between study group and control group for child-centered literacy score (CCLS).
Taiwan. Meanwhile, message reinforcing repeatedly by doctors about the importance of reading aloud, and the initiation of reading aloud demanded by children themselves make ROR a suitable and convenient method to be promoted by pediatricians or general physicians.

Over the past few years, the structure of family has been changing in Taiwan society. There are increasing numbers of children cared for by grandparents, new Taiwanese children (the offspring whose mothers came from Southeast Asian), single-parent families, or children in poverty, who may be in socially and economically disadvantaged situations that lack environments that promote language and literacy growth. ROR has been designed to target low-income families by providing materials, education, and support to focus on books and reading aloud as one of the most important parenting skills in parent-child interaction.\textsuperscript{14,15,17} Family literacy orientation could be increased by a simple intervention where pediatricians distribute children’s books to the children of low-income parents at their well-baby clinics. In our study, 20% of the children were taken care of primarily by grandparents, but their parents came home usually on the weekend to see them. However, there was

\begin{table}[h]
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\small
\begin{tabular}{|l|c|c|c|}
\hline
\textbf{Parent-child interaction} & \textbf{Intervention (n = 205)} & \textbf{Control (n = 210)} \\
\hline
\textbf{Reading together with child:} & \textbf{Adult’s reading habit} & \textbf{Adult’s reading habit} \\
Yes & 87.14% & 93.77% \\
>3 d/wk & 46.00% & 52.09% \\
\hline
\textbf{Shared-reading as one of three favorite parent-child interactions} & Yes & No & Yes & No \\
Yes & 73.30% & 97.77% & 75.24% & 62.51% \\
& 89.20% & 66.10% & & \\
\hline
\textbf{Child} & & & & \\
Interesting in shared-reading & Yes & 92.43% & 73.59% \\
TV viewing h/d & No & 12.84% & 26.26% \\
Yes <2 h & 76.41% & 58.41% \\
>2 h & 10.75% & 15.33% \\
\hline
\textbf{Mean of child-centered literacy scores} & 4.39 ± 1.55 & 3.55 ± 1.65 & \\
\hline
\multicolumn{4}{l}{There was significant difference between intervention group and control group for all parameters (all } p < 0.01 \text{ by } \chi^2 \text{ test or } t \text{ test).}
\end{tabular}
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\begin{table}[h]
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\begin{tabular}{|l|c|c|c|c|}
\hline
\textbf{Caregiver} & \textbf{Infant group (n = 99)} & \textbf{Toddler group (n = 106)} \\
\hline
& After & Before & After & Before \\
\hline
\textbf{Reading habit} & & & & \\
Yes & 77.08% & 71.88%* & 83.16% & 71.23%* \\
\hline
\textbf{Parent-child interaction} & & & & \\
Reading together with child: & & & & \\
Yes & 81.72% & 42.71%** & 92.55% & 62.32%* \\
>3 d/wk & 48.39% & 26.04%** & 43.62% & 20.29%* \\
\hline
Shared-reading as 1 of 3 parent-child favorite interactions & Yes & 78.89% & 53.24%** & 67.71% & 51.12%* \\
\hline
\textbf{Child} & & & & \\
Interesting in shared-reading & Yes & 95.45% & 47.83%** & 98.84% & 77.94%* \\
TV-viewing hour/day & No & 19.15% & 28.72%* & 25.00%** \\
**Yes <2 h & 70.21% & 58.51%* & 82.61% & 61.76%* \\
>2 h & 10.64% & 12.77%* & 10.87% & 13.24%* \\
\hline
\textbf{Mean of Child-Centered Literacy scores} & 4.44 ± 1.65 & 3.13 ± 1.69* & 4.37 ± 1.43 & 3.39 ± 1.57* \\
\hline
\multicolumn{4}{l}{a *p < .05, **p < 0.01, between after- and before- intervention in both groups.}
\multicolumn{4}{l}{b No significant difference was noted between both groups after intervention when controlling base line CCLS.}
\end{tabular}
\end{table}
still a trend that those children with primary grandparenting were read to or with less than children with their own parents. The percentage of indigenous and foreign spouse families was too small to analyze.

There were limitations in the study worth noting. First, family income is an important factor influencing parent-child reading together; however, many adult participants refused to answer this item in the questionnaire; thus the influence could not be examined in this study. Second, although the best measure of a book-sharing environment and interaction is through direct observation in the subject’s home, we used parental report as a more convenient and less costly means of measurement. Social desirability might induce parents to over report their reading attitudes and behaviors, but researches showed that outcome of children based on direct-blinded measurement was similar to parent-report studies.17

Our findings were specific in the pediatric studies in Taiwan pediatric care. Some issues generated from our results deserve further discussion in the future: the language development and later academic achievement in those intervention children; and intervention effects between different ethnic and different family structure. Meanwhile, is there any opportunity to administer the ROR program to other pediatric clinics in Taiwan? The answer is certainly yes. Pediatricians have special expertise and commitment in promoting children’s development, and are also in a special position to participate in community partnership efforts that promote childhood health care. Whoever, the health outcomes that they are traditionally involved with are limited mainly to reducing problems that interfere with learning and health, such as low birthweight, nutrition, and injuries. With the chance to establish the ROR program, pediatricians in communities could organize an association to: (1) unite current well-accepted vaccination schedules with literacy anticipatory guidance; (2) enlist story-telling volunteers from local elementary schools, library or communities; and (3) fund financial support from enterprisers or local government. Thus pediatricians could advance their patients’ outcomes to include literacy promotion.

Conclusion

This study has shown that the simple intervention adopted from the ROR program, also could change Taiwanese parents’ attitudes toward the importance of reading with their infants and toddlers. As primary health care providers, pediatricians are in a unique position to affect and encourage parental behaviors that foster early literacy development in children. Since research has pointed out many benefits to young children through parent-child reading together, just as Dr Klass declared about pediatricians being involved in literacy promotion: "doing it for all the right reasons" 30 this good idea may also be promoted by pediatricians in Taiwan.

Acknowledgments

We thank the nurses and volunteers at the outpatient clinic in Lotong Hospital. Without their involvement, the program could never have been implemented at the Taiwan pediatric clinic. We also thank all personal financial donors. With their generous financial support, hundreds of infants left our well-baby clinic with a lovely book except the vaccine shot during 2007.

References


