

Effectiveness of a Coordinated Community Effort to Promote Early Literacy Behaviors

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Abstract The purpose of this study is to report on the effectiveness of a coordinated, community-wide intervention to promote early literacy behaviors with low-income parents, especially parents with limited English language proficiency. The interventions include book distribution programs that were based in clinical settings, childcare centers and home visitation programs. The intent of these interventions was to communicate a message that reading to infants and young children and accessing services at the public library are beneficial. The methodology involved in the administration of a Community Based Parental Survey (CBPS) included questions related to early literacy behaviors in order to evaluate the effectiveness of these efforts. Two independent samples collected in 2001 and 2003 were compared. The data comparison between the two time periods showed a 77% increase in parents reporting that they showed books to their infants on a daily basis. There was also a 71% increase in parents reading books aloud to their children on a daily basis. Other indicators also improved. Establishing an early reading ritual encourages infants to have an association to books, helps in language acquisition and supports the social and emotional connection between a parent and his or her young child. The act of holding an infant and reading to him/her on a consistent basis can improve health literacy and hopefully

improve student reading achievements. Early interventions like these are relatively low cost and can yield considerable long term results. We conclude that multi-level community based interventions show positive trends in promoting early literacy behaviors.

Keywords Community interventions · Parent behaviors and early literacy behaviors

Background

Children who live in poverty, in homes where English is not the primary language, and whose parents have limited education, are frequently unprepared for the structured learning environment in school. These children have consistently been identified as the group that has difficulty passing reading proficiency tests in third grade and in completing high school [1–3]. Bilingual children in the fourth and eighth grades have improved their reading scores nationally but Hispanic children continue to lag behind their African American and Caucasian peers in reading skills. In 2003, a 12% difference in reading scores was reported between Hispanic and non-Hispanic peers on national education tests [2–4]. The 2007 National Assessment of Educational Progress (NAEP) of children's reading comprehension reported that a substantial number of children continue to enter kindergarten without knowledge of or experience with printed materials. The effects of poverty have been found to be a major contributor to these deficiencies [2, 4, 5]. Interventions that promote reading to young children, especially for these low-income and low resource families, can change this trend. Investing resources to enhance a child's academic success is critical, especially among Hispanic and low-income children who

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may have less access to books and printed materials in their homes.

Parental involvement in developing their children's early literacy skills is universally recognized as important in child development [5, 6]. During the past 20 years, numerous studies have indicated that a child's early language development is enhanced by parents introducing their young children to books and reading to them [7–9]. Evidence from these studies indicate that the frequency with which the parents read aloud to their children, and the number of books in the home, is associated with increased vocabulary and improved listening and comprehension skills when children start attending school [9]. Early literacy skills (vocabulary etc.) are also correlated with a child's reading scores in the third grade [10]. The number of books available in the home has been found to be a good indicator of parental literacy and subsequently their engagement with books [11]. Early literacy behavior has been linked to parents who have books in the home and read to their infants. Early literacy can cross generations and reduce the impact of a poor environment [9, 12, 13].

Evidence For Book Distribution Programs

Book distribution interventions have occurred in primary care clinics, emergency rooms, and pediatric offices. Free books with simple instructions to parents increase the opportunities for parents of young children to read to their children at home [14–18]. A study conducted in Australia found that a book distribution program that is dependent on parents engaging in a clinic or community service agency can be a barrier unless attention is paid to the cultural aspects of the books and the parents [19]. Lynch's 2008 study showed that engaging preschool children with printed materials improved their early literacy skills when they entered school, especially for low-income children enrolled in a Head Start program [20]. Engaging young children with printed materials and reading aloud to them lays the foundation for the emergence of literacy skills which may counter disparities in children's academic success [2, 21, 22]. Parental literacy is associated with poor preventive health care for their children and poorer child health outcomes than parents with higher levels of literacy [22]. Engaging parents in improving their literacy can also improve a child's health and literacy behaviors.

Public libraries are traditional community based programs that encourage early literacy behaviors for adults and children. Birckmayer (1991) showed that parents, who entered the library with their children, accessed more books and participated in family literacy programs. These behaviors were also shown to prepare the children for school [23]. Public libraries are part of the community system that supports literacy behaviors. Libraries have

reading circles for children and adults and adult literacy programs that are free or low cost to the public. Entering the library and obtaining a library card provides exposure to these programs.

A single intervention can have a positive effect on families that participate in these programs, but a community wide effort can reach more families and have a greater effect. This study reports on behaviors likely related to a coordinated multi-level community effort over a four-year period, to improve early literacy behaviors among low-income and mono-lingual Spanish speaking families, residing in a community in northern California. There are limited studies that test the effectiveness of an organized community intervention to promote early literacy activities [24, 25]. Collaboration and coordination with community organizations to implement book distribution programs and to evaluate the efforts of this coordination are limited [26]. Organizations and agencies that work in isolation limit the coordination and limit building a system of care that is needed to tackle these large social problems [23, 27]. Our study is focused on community interventions to promote early literacy behaviors. Evaluation of the impact of these interventions was made using data from a telephone survey of families in 1999 and 2003. This study focuses on low-income and Hispanic parents' behaviors in relation to early literacy behaviors.

Description of Early Literacy Interventions

Leaders from several community programs began discussions on how to improve childhood literacy within the county in 1998. They developed a plan to increase access to books for infants from low income families and to increase early literacy activities within the family. This community effort has extended until the current time with the inclusion of the FIRST 5 Commission that used tobacco tax funding to support activities for young children in 2002. The interventions were coordinated by community organizations ranging from home visits, clinic visits and at childcare centers. The following are descriptions of the major programs that were involved.

Prenatal to Three Initiative

In 1998, the Prenatal to Three (PTT) Initiative was organized after extensive community planning to support child health and development during the prenatal period through the child's third birthday. A major part of the initiative was the PTT program of home visitation. During the study period, the PTT program staff of public health nurses and community health workers provided home visits to approximately 80–90% of the low-income families

Table 1 Common elements for all of the interventions

All of the intervention efforts included the following practices:

- Distribute high quality books for infants through multiple sites and community agencies. Child librarians compiled a list of age appropriate and culturally relevant books
- Model reading behavior with the parents. This include pointing to pictures and telling a story about the pictures, making up or telling new stories in Spanish or English, and sharing an intimate and a nurturing experience with their children
- Stress the importance of having a regular reading routine at home
- Promote the use of public library services and literacy programs
- Inform the parents about the important role they play in preparing their children for school

residing in San Mateo County (started with 200 families and expanded to approximately 1,500 families a year in 2003). The majority of families served (75%) were monolingual Spanish speaking [28].

During the initial home visits, the public health nurse gave the family a gift bag that included a cardboard book for their infant, an application for a library card, and a voucher for a free baby T-shirt redeemable at the public library. The T-shirt voucher was an incentive for the parents to enter the library and use the services available there. The public library system was a community partner in the initiative. The PTT staff assessed the parents' literacy skills and referred them to adult literacy classes and English as a Second Language when appropriate. Parents were also encouraged to read the books aloud or tell stories to their infants on a regular basis. Infant reading practices were also included in the curriculum of the weekly parenting classes held at the public library or other public meeting rooms. Central to this intervention was the opportunity for group reading and storytelling for families with very young children [28].

Peninsula Partnership For Children, Youth, and Families (PPCYF)

The PPCYF, a philanthropic organization that supported community efforts, is an active member of the Prenatal to Three Initiative. The foundation supported a project named, "Raising a Reader" that began in 1998 by distributing age and culturally appropriate children's books to select pre-schools, in order to increase the numbers of books in the homes of low-income children. In 1999, the "Raising a Reader" book distribution project expanded to include families enrolled in the PTT home visitation program. This program introduced more infant and culturally specific books to low income families with children under the age of three [29]. Rotation of books to families with infants was more difficult because the infants tended to put the books in their mouths as part of their reading experience making rotation of the books impossible due to the potential transmission of infection.

Reach Out and Read Project

A large pediatric clinic in the community participated in the "Reach Out and Read" project and started book distribution in 1998. This project distributed new books to families who brought their infants to the clinic for well-child check-ups. The goal of this program was to promote early literacy behaviors for low-income Hispanic families [30–32].

California's FIRST 5 Commission

In 2002, after California's passage of Proposition 10, the FIRST 5 Commissions used tobacco tax money to develop and support programs for children between birth and age 5 years old. Many new programs were developed to enhance early childhood social, emotional, and educational development within the state. A significant focus of these funds was on early literacy behaviors that prepared young children for entry into school.

The coordination of these community efforts was deliberate and focused on improving early literacy skills for all children, but especially for those who were low-income and Spanish speaking. For many participating families, the books were among the first playthings experienced by the infants and young children living in the home. Table 1 illustrates the common elements for all of the interventions coordinated through these early literacy exposure efforts.

Methodology

Community Based Parental Survey

The Community Based Parental Survey (CBPS) is a structured telephone interview designed to identify health and social behavioral changes in a community sample. The CBPS was administered to a random sample of 300 parents and repeated in consecutive years to identify trends. The

2001 survey period was chosen as an indicator of a period of time when early rollout of the programs was gaining ground within the community. The 2003 survey period was chosen because it reflected rapid program growth with the influx of FIRST 5 funding into community programs. The survey instrument was adapted from the Johns Hopkins University standardized survey of parents participating in their “Healthy Steps for Young Children Program” [33]. The survey instrument and the added questions were translated into Spanish and adjusted where needed for clarity.

Sampling Strategy

The same survey instrument was used with randomly selected parents using two different sampling strategies. In the 2001 survey, electronic birth certificate data were obtained from a Medicaid managed care organization, after the study research coordinator signed a confidential data use agreement. Randomization of potential respondents was accomplished by using SPSS software. Sample size was calculated at an alpha level of 0.05 and a confidence interval of 0.80 with specified 2 tailed tests controlling for skip patterns in the survey requiring 300 respondents. A sample of 1,500 mothers with children under the age of three years old was used for this survey. A professional survey organization conducted the telephone survey in Spanish or English based on the respondent’s preference. Four attempts were made to find, schedule and complete the interviews. Non-respondents were the result of a wrong phone number, the parents moving out of the area without giving a forwarding phone number or no answer over a five-day period leaving a sample of 856 mothers. Five hundred and eleven families were contacted until 300 surveys were completed, resulting in a 41% refusal rate.

In 2003, the PTT program and the FIRST 5 Commission collaborated in a request to sample all parents with a child less than 6 years of age, who resided in San Mateo County. Random digit dialing of potential parents was based on a purchased list of household phone numbers in the county. The demographic criteria for sorting the parent participants was the children’s age of 5 years or younger. A series of eligibility questions established that there was at least one child living in the home who met the criteria. A similar power analysis was used based on the population in the county. It was calculated that a sample of 600 parents was required. Of the first 840 families contacted, 600 agreed to complete the survey, resulting in a refusal rate of 28%. Human subject approval for the 2001 and the 2003 survey protocols were independently obtained through a local medical society’s Internal Review Board.

Outcome Measures

Primary outcome measures for this study were: the frequency that the parents showed books to their child; read to their child; interacted and played with their child; and drew pictures with their child in the past week. The scores ranged from 1 = never to 4 = almost daily. Additional outcome variables included whether the parents took their child to the library attended an event at the library and participated in the “Raising a Reader” program.

Results

In order to compare two independent samples it was important to review the characteristics of both samples. Demographic characteristics noted in Table 2 estimate comparability between the 2001 and 2003 samples based upon: maternal age, preferred language, family income, marital status, place of birth, payment source for birth and whether the respondent was Hispanic. Low-income status was determined by the answer to a categorical household income question and the use of Medicaid for the birth of the child. The first sample was primarily low income Spanish speaking mothers with some lower educational attainment when compared to the second sample. The sampling strategies for the second sample were different and low income status was based on use of Medicaid for the birth of the qualifying child. Mothers in the 2003

Table 2 Characteristics of respondents in both samples

	Survey I PTT low income respondents N = 300	Survey II–F5 & PTT N = 216 low income respondents
Maternal age at first birth ** mean (sd)	21.25 (4.1)	22.57 (5.4)
Child age mean (sd) **	1.14 years (0.37)	2.27 (1.7)
Married or marriage like	225 (87.2%)	182 (84.3%)
Household income		
<\$15,000 a year	123 (47.7%)	55 (25.5%)
≥ \$15,000 but < \$30,000	124 (48.1%)	93 (43%)
≥ \$30,000 but < \$50,000	11 (4.1%)	68 (31.5%)
Educational level less than high school *	164 (63.9%)	111 (51.6%)
Speak language other than English *	83 (32.2%)	84 (38.9%)
Self identify Hispanic	213 (82.6%)	150 (69.4%)
Born in US	35 (14.7%)	49 (22.7%)
Father of baby living in home	198 (76.7%)	146 (67.6%)

**P value < 0.001, *P value ≤ 0.005

Table 3 Comparison between two surveys on early literacy behaviors

	2001 Survey	(%)	2003 Survey	(%)	Difference between proportions (%)	Ratio between proportions (%)
Past week did you:	#		#			
Show books to child	161	53.67	150	69.44	15.78	77.28
Read books	99	33.00	116	53.70	20.70	61.44
Play with child	253	84.33	204	94.44	10.11	89.29
Draw pictures together	64	21.33	87	40.28	18.94	52.96
Hug and cuddle	258	86.00	216	100.00	14.00	86.0
Go to Park in past 6 months	150	50.00	142	65.74	15.74	76.06
Visit library	109	36.33	103	47.69	11.35	76.19
Attend event at Library	42	14.00	54	25.00	11.00	56.0
Participate in Raising a Reader	13	4.33	36	16.67	12.33	26.0

sample were slightly better educated than in the 2001 sample.

Early literacy behaviors include showing books to the infants, reading to the infant, playing and cuddling with the infant and drawing pictures together almost daily or once a day. The questions were focused on activities with the respondent’s infants even though some children were toddlers at the time of the interview. Visiting the library or the park in the past six months, attending an event at the library and participating in the Raising a Reader program increased between the two time periods. Table 3 illustrates the results from both of the survey’s respondents for these activities.

The most common early literacy behaviors reported by parents was showing books and reading to their infants almost daily. The data comparison between the two time periods showed a 77% increase in parents reporting that they showed books to their infants on a daily basis. There was also a 71% increase in parents reading books aloud to their children on a daily basis. Other behaviors also showed an increase in rates of these activities consistently between the two time periods. Five percent of mothers reported engaging in the Raising a Reader program in 2001, while 16.7% reported participating in the program by 2003 indicating the dispersion of the program had increased within the two year period. Figure 1 illustrates the trends in these early literacy behaviors comparing the two years of survey administration.

Limitations

This study has design limitations. It is not clear which intervention most influenced the parents’ behaviors. It is possible that a multiplier effect from simultaneous interventions reinforced the behaviors, but it was difficult to

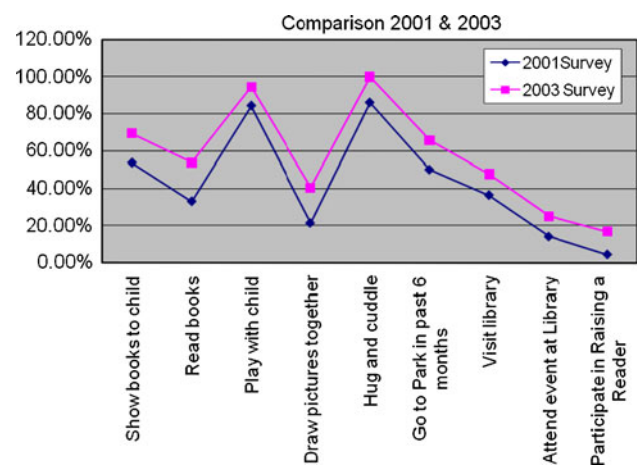


Fig. 1 Comparison between 2001 and 2003 Surveys: Early Literacy Behaviors

link specific interventions to respondents. While both samples were taken from the same county, the coordinated community effort had methodological challenges in that it lacked a longitudinal study of the same families. As such, we do not know which families were contacted for both surveys. In addition, the study participants were not randomly assigned to an intervention. Because the goal of the community-based intervention was to reach as many low-income families as possible, random assignment was not an option [34]. Instead, we chose to use a random selection of comparable low-income parents residing within the same county during two different time periods to illustrate the trends in early literacy behaviors which is consistent with community based research methods [34].

Conducting telephone interviews is an additional limitation of the study. Some of the very poor families in the county may not have had a telephone or they shared a phone with multiple families living in the same house. The lack of a telephone would make it difficult to contact all

eligible families and could have biased the results. Although we over sampled to compensate for this possibility, selection bias was possible.

Discussion

The primary goal of this study was to evaluate the effectiveness of a community-wide intervention to promote early literacy behaviors in low-income families and to compare the results at two time periods after the implementation of the interventions. The findings indicate positive trends in parents' behaviors. The power of the study helped provide some level of assurance that the number of subjects studied was representative of the population residing in the county. We found that many low-income families, many who were Spanish speakers in our sample, were incorporating early literacy behaviors into their daily lives. Although it was unclear which effort had the greatest impact, the simplicity of these interventions and positive results found from the evaluation of these efforts, support further development.

The multiple home visitations, clinic based and community organization interventions worked in purposeful collaboration to support early literacy behaviors. The intention of this approach was that children in the county would have greater access to reading materials and role modeling that would hopefully have improved literacy skills when they enter preschool. Preparing disadvantaged children for preschool was a central focus of these efforts. Visiting the library, while not specific to early literacy behaviors, exposes mothers and their young children to books, adult literacy programs and reading behaviors with parents. Family socioeconomic status is a social determinant of health. National reports have repeatedly indicated that children who are raised in low-socioeconomic households and where English is seldom spoken, experience greater educational and health problems across the lifespan [35]. Intervening at birth with many of these families and focusing critical language and literacy development can change this trajectory [36]. Additional community based research efforts could be conducted to determine if the effects remained the same or increased in subsequent years.

We speculated that multiple community interventions, occurring over multiple years, targeting low-income parents by design, could result in a positive multiplier effect. It was both possible and planned that low-income families would have many different exposures to the book distribution interventions within the community. Reinforcing the message that reading to infants was an activity that improved the parent's relationship with their children and supported their children's growth and language development were essential elements to these efforts. Having more

than one access point for the message and the intervention was planned. The majority of different interventions target one population group without understanding if they are also receiving the same message from another clinic or intervention site. Only looking at one intervention and ignoring the community effects could confound the findings of a separate study. This coordinated intervention supports a consistent social message and has the potential to initiate very young children into the world of language, books and reading. It also educates parents about the significance of their behaviors which was the intended message.

Conclusion

Children who are born into low-income families should not suffer the consequences of chance birth. Parents want their children to excel and to achieve levels of success in their lives despite living in poverty. If poverty and low literacy are determinants of poor life outcomes, then early and consistent messages that can influence behavior change are needed [36]. It takes a village of programs and supportive benefactors to support these efforts. The cost of these kinds of programs is minimal compared to a life time of being unable to read and to engage fully in educational opportunities.

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