Four-Year-Old Outcomes of a Universal Infant-Toddler Shared Reading Intervention

The Let's Read Trial

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Objective: To determine the emergent literacy and language effects of a low-intensity literacy promotion program (Let's Read) provided via universal well-child services to parents during the first 4 years of their child's life.

Design: Population-based, cluster randomized controlled trial performed between March 1, 2006, and December 10, 2010.

Setting: Maternal and child health centers (clusters) in 5 relatively disadvantaged local government areas in Melbourne, Australia.

Participants: All parents attending their 4-week well-child appointments in participating centers were invited to take part in the study.

Intervention: The Let's Read program was delivered at 4, 12, 18, and 42 months during universal well-child care visits.

Main Outcome Measure: Child emergent literacy skills (intrasyllabic, phonemic, and sound/letter knowledge) and language (core, receptive, and expressive), measured at 4 years of age.

Results: A total of 630 parents participated, with 365 children in 32 intervention clusters and 265 children in 33 control clusters; 563 children (89.4%) were retained in the study to 4 years of age. The adjusted mean differences (intervention minus control) for emergent literacy was 0.2 (95% CI, −0.2 to 0.6; $P=.29$) for intrasyllabic units, 0.05 (95% CI, −0.4 to 0.5; $P=.85$) for phonemic awareness, and 0.1 (95% CI, −1.5 to 1.6; $P=.92$) for letter knowledge. For language, the differences were 1.6 (95% CI, −1.1 to 4.3; $P=.25$) for core, 0.8 (95% CI, −2.0 to 3.7; $P=.56$) for receptive, and 1.4 (95% CI, −1.4 to 4.2; $P=.32$) for expressive scores.

Conclusion: This population-wide primary care literacy promotion and book distribution program provided neither the anticipated benefits to literacy and language nor enhanced uptake of literacy activities at 4 years of age, even when targeted to relatively disadvantaged areas.

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C HILDREN WHO ARE READ TO more often and earlier in life have better academic and social outcomes at school,[1] which in turn predict their future work and life outcomes.[2] Unfortunately, children from poorer households are less likely to have environments rich in literacy activities,[3] and school-based data

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collections demonstrate growing social disparities in primary and secondary school literacy.[4,5] Longitudinal[6,7] and intervention[8-10] studies suggest, but have not yet confirmed, that systematized early literacy promotion targeted to disadvantaged children could improve these outcomes.

Recent literature reviews[11-14] have identified several features of early literacy environments that most consistently predict better outcomes. These reviews suggest that children who achieve at school typically have more books in the home, have parents that report reading to them more frequently (usually every day but at least 3 times per week), and begin shared reading at a very early age (usually before 18 months of age). How parents read to children also appears to be important. The dialogic approach is a child-adult interactive approach to reading aloud that, compared with other styles,[15] predicts better emergent literacy skills, such as print motivation, vocabulary, print awareness, narrative skills, letter knowledge, and phonologic awareness.[2,16]

If one assumes these relationships to be causal, then interventions that improve the

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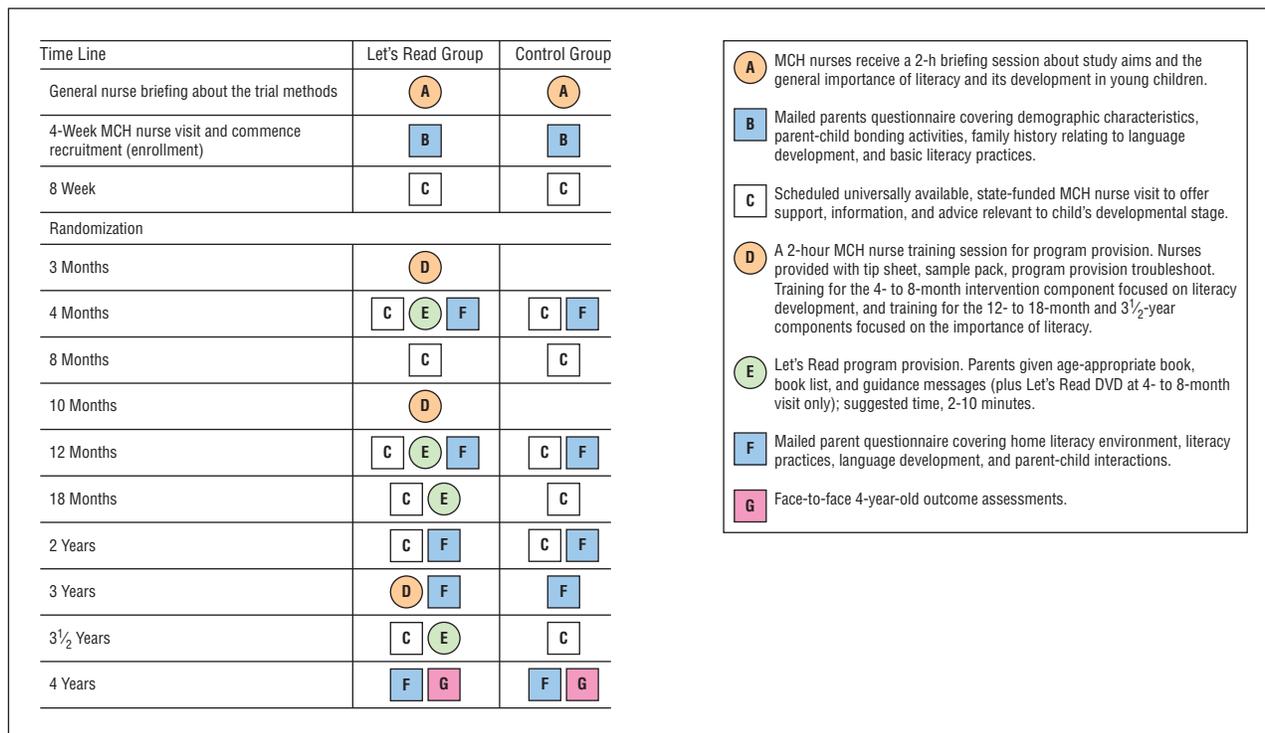
Time Line	Let's Read Group	Control Group
General nurse briefing about the trial methods	A	A
4-Week MCH nurse visit and commence recruitment (enrollment)	B	B
8 Week	C	C
Randomization		
3 Months	D	
4 Months	C E F	C F
8 Months	C	C
10 Months	D	
12 Months	C E F	C F
18 Months	C E	C
2 Years	C F	C F
3 Years	D F	F
3½ Years	C E	C
4 Years	F G	F G

A — MCH nurses receive a 2-h briefing session about study aims and the general importance of literacy and its development in young children.

B — Mailed parents questionnaire covering demographic characteristics, parent-child bonding activities, family history relating to language development, and basic literacy practices.

C — Scheduled universally available, state-funded MCH nurse visit to offer support, information, and advice relevant to child's developmental stage.

D — A 2-hour MCH nurse training session for program provision. Nurses provided with tip sheet, sample pack, program provision troubleshoot. Training for the 4- to 8-month intervention component focused on literacy development, and training for the 12- to 18-month and 3½-year components focused on the importance of literacy.

E — Let's Read program provision. Parents given age-appropriate book, book list, and guidance messages (plus Let's Read DVD at 4- to 8-month visit only); suggested time, 2-10 minutes.

F — Mailed parent questionnaire covering home literacy environment, literacy practices, language development, and parent-child interactions.

G — Face-to-face 4-year-old outcome assessments.

Figure 1. Components of the Let's Read trial.[33] MCH indicates maternal child health.

quantity and quality of literacy activities in the homes of young children hold great practical appeal, particularly for more disadvantaged children. Therefore, with extraordinary rapidity for a public health intervention, whole-of-community and primary care early literacy promotion programs have been implemented in many countries in the last decade.[17-20] Despite their substantial costs, particularly when provided to entire populations, evidence of their effectiveness lags behind their implementation.

Several clinic-based intervention studies[21-24] indicate that literacy promotion activities such as information, modeling of shared reading, and free books can benefit receptive and expressive language, aspects of school readiness, and the frequency of home-based literacy activities in disadvantaged young children, particularly those from ethnic minority groups. Their conclusions are, however, limited by nonrandomized designs[22,24,25] and/or small clinic samples (122-205 participants). Follow-up periods have been limited to at most 12 months after intervention,[21,26,27] with no trials demonstrating benefit to longer-term emergent or school literacy outcomes.

Evidence regarding more general population-wide book distribution programs is mostly limited to the United Kingdom's Bookstart, with a recent before-and-after evaluation of the national program revealing no effect on reading frequency at a population level, although low-reading families (few times a week or less) increased their daily reading by 30%.[28]

We report on the 4-year-old outcomes of Let's Read, a cluster randomized controlled trial of an Australian preliteracy promotion program targeting all children living in relatively disadvantaged neighborhoods (ie, a universal program delivered within a geographically targeted population). We aimed to determine whether a low-intensity, clinic-based literacy promotion program provided during the first 3½ years of life improves emergent literacy and language outcomes by 4 years of age when provided by nurses from a universal health platform. Interim results did not suggest benefit to parent-reported language at 2 years of age,[29] but we hypothesized a priori that by 4 years of age the intervention group would show better mean scores than the control group on (1) the primary outcomes of child emergent literacy skills (intrasyllabic, phonemic, and sound/letter knowledge) and language (core, receptive, and expressive) and (2) the secondary outcomes of home literacy environment measures.

METHODS

STUDY DESIGN

The Let's Read cluster randomized controlled trial (ISCRTN 04602902) commenced in March 2006. It took place in 5 of the 31 local government areas comprising greater metropolitan Melbourne (population of 4.1 million in 2010),[30] Australia, selected through a 2-stage random sampling process. In the first stage, Melbourne's local government areas were ranked by mean score on the Socio-Economic Indexes for Areas Index of Disadvantage derived from the 2001 Australian Census data.[31] From those in the most disadvantaged tertile, we selected a convenience sample of 5 areas, each with a birth rate of more than 1000 births per annum. The trial was approved by the Royal Children's Hospital Ethics in Human Research Committee.

STUDY PARTICIPANTS

All newborns in the state of Victoria are allocated a publicly funded local maternal and child health center for well-child care provision during the first 5 years of life, with more than 95%

Table 1. Main Measures and Their Timing

Construct	Measure	No. of Items	Score Details	Additional Information[a]
Primary child outcome measures				
Literacy	Sutherland Phonological Awareness Test Revised[35]	10; 10; 26	Intrasyllabic subtest raw score range of 0 to 10; phonemic subtest raw score range of 0 to 10; sound/letter knowledge raw score range of 0 to 26	Modified author-approved version of the Sutherland Phonological Awareness Test. Yields quantitative raw score for each of child intrasyllabic, phonemic, and sound/letter knowledge.
Language	Clinical Evaluation of Language Fundamentals– Preschool, Australian Second Edition[36]	57	Mean (SD), 100 (15)	Yields standardized scores for each of core, receptive, and expressive language.
Secondary child outcome measures				
Home literacy environment	StimQ-P[37]	37	Range, 0-40	The measure was initially designed as a home observation tool but was used in this study as a parent-completed survey. The measure has age-appropriate versions. The StimQ-P has 4 subdomains: parental verbal responsivity, reading, parental involvement in developmental advance, and availability of learning materials. The ALM was not used for this study. This measure was administered via the parent-completed outcome survey.
Other child measures				
Nonverbal cognitive ability	Matrices subtest of the Kaufman Brief Intelligence Test, Second Edition[38]	108	Mean (SD), 100 (15)	Yields standardized subscale scores for each of verbal and nonverbal IQ. The subscales are combined to form the IQ composite score.
Parent measures				
Parent language abilities	Word reading subtest of the Wide Range Achievement Test[39]	60	Mean (SD), 100 (15)	Overall measure yields standardized scores for reading composite (word reading and sentence comprehension subtests) and math computation. The word reading subtest was used for this study.
	Adult Test of Non-Word Repetition[40]	28	Range, 0-28	Contains nonwords ranging in length from 2-5 syllables. There are 7 items at each syllable length.
	Mill Hill Vocabulary Scale[41]	44	Range, 0-44	Completed by child's father (by mail) and mother. Alternate word lists were provided. Multichoice answers with definitions, forms A and B.
Attitudes to reading	Study-developed measure	5	5-Point Likert scale (strongly disagree to strongly agree)	Items were (1) reading to my child is important, (2) I feel confident about reading books to my child, (3) I enjoy reading books to my child, (4) my child enjoys being read to, and (5) compared with other activities, such as playing outside, reading is my child's favorite activity. This measure was administered via the parent-completed outcome survey.

Abbreviations: ALM, Availability of Learning Materials; StimQ-P, StimQ-Parent.
[a] All measures were administered at outcome assessments unless otherwise specified.

attending the 4- to 8-week-old well-child visit.[32] All nurses were asked to approach all parents of infants attending this visit during a 3-month staggered recruitment period in each of the 5 areas between March 1 and August 31, 2006, excluding only parents thought by the nurse to have insufficient written English proficiency to understand the study materials, which were written at a sixth-grade reading level. Nurses forwarded contact details of interested parents to the research team, who telephoned families to confirm eligibility, and then mailed a consent form and enrollment questionnaire. Parents were considered enrolled on receipt of the signed consent form. Enrolled parents participated until their child's outcome assessment at 4 years of age, unless they asked to be removed from the study.

RANDOMIZATION AND MASKING

Once all participants were recruited, maternal and child health centers (clusters) were stratified by local government areas and randomly allocated to intervention or usual care (control) arms using block randomization with fixed block sizes of 2 after rank ordering the centers by the number of estimated expected eligible families. The initial 74 centers were combined into 65 clusters to avoid nurses who work at more than one center being

at both a control and an intervention site. The randomizing statistician was unaware of the identities of the clusters, thus ensuring allocation concealment.

INTERVENTION

Nurses in the intervention arm delivered the Let's Read program at 4 time points during the usual 4- to 8-week, 12- and 18-month, and 3½-year-old well-child care visits. All intervention nurses attended 2-hour group training sessions run by the research team 5 weeks before each intervention point. Our educational strategies comprised role-play, feedback, and modeling practice, supported by tip sheets and a desk mat acting as a quick trial reference guide and reminder.

Figure 1 outlines the time sequence and interventions pictorially. At each time point, intervention nurses were asked to spend approximately 5 minutes delivering, modeling, and discussing the Let's Read literacy promotion messages with the parent. Each intervention family also received a Let's Read take-home pack containing an age-appropriate picture book, book list, and guidance materials designed to enhance literacy acquisition through shared reading activities characterized by interactive reading style, parental verbal responsiveness, and ap-
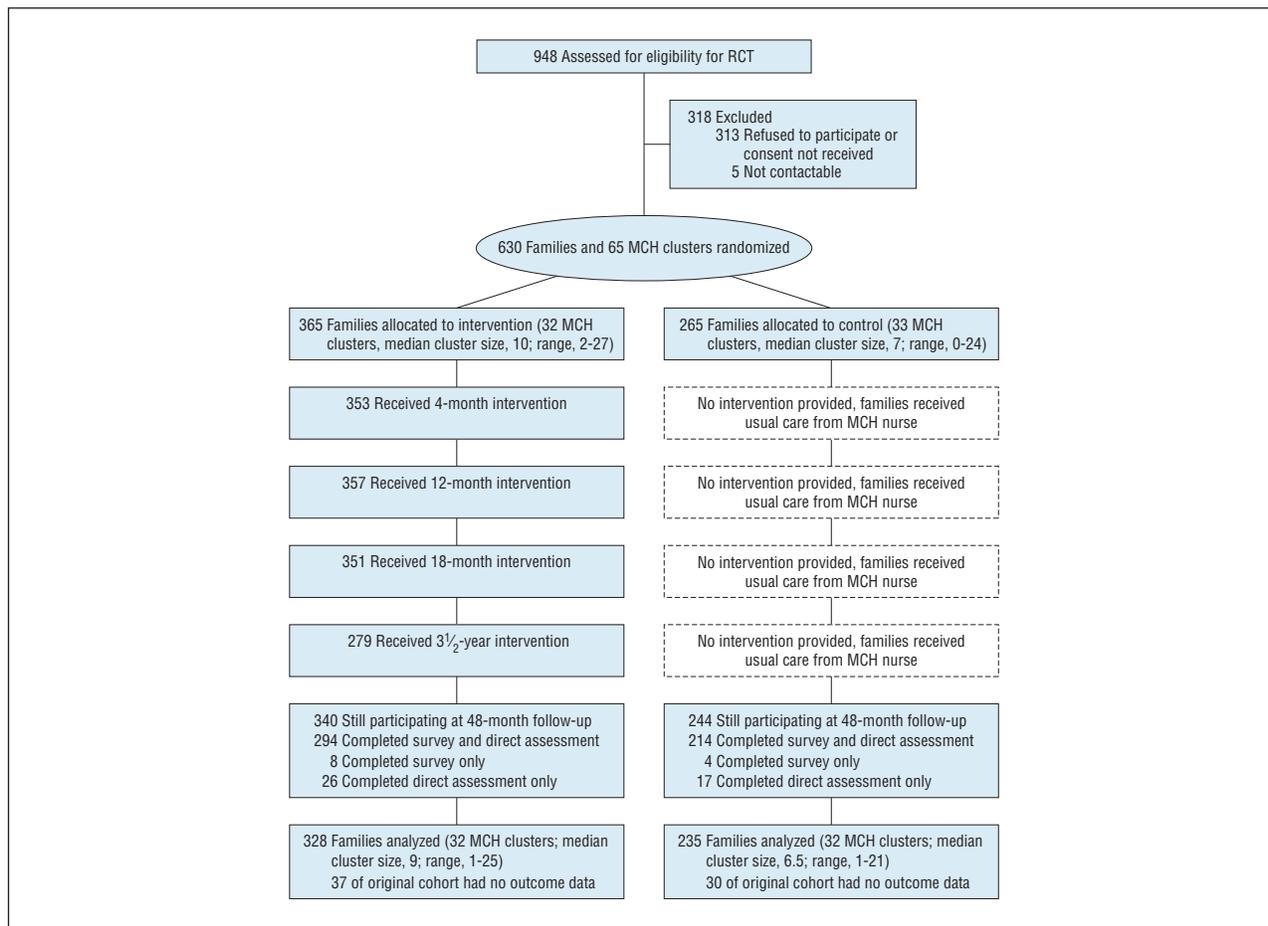
Figure 2. CONSORT (Consolidated Standards of Reporting Trials) flow diagram.[45] MCH indicates maternal child health; and RCT, randomized controlled trial.

propriate book selection.[9,34] Both the intervention and control group nurses continued to provide their usual care at all key well-child care visits between 0 and 5 years of age.

DATA COLLECTION

Families completed surveys at enrollment and when the study child was 3 to 4 months old (before intervention) and when the child was 1, 2, 3, and 4 years of age. At 4 years, trained research assistants, masked to children's allocation status, conducted direct child outcome assessments and brief assessments of the attending parent's language and literacy. Both parents also completed a short, written, multichoice measure of their own vocabulary.

MAIN OUTCOME MEASURES

Table 1 details the trial's primary and secondary outcome measures. Baseline equivalence between the 2 groups was assessed by sociodemographic information and study-developed measures of family history of language and literacy difficulties collected at enrollment. This measure was supplemented by direct assessment at 4 years of age of children's nonverbal cognitive ability (not targeted by the intervention) and parent language and literacy skills (Table 1).

Potential confounders were parental mental health, measured using the 12-Item Short-Form Health Survey (physical component summary and mental component summary scores)[42] at 3 to 4 months, the child's sex, whether English was the main language spoken at home, the primary caregiver's (usually the mother's) educational level (did not complete school, com-

pleted school, or university degree), health care card status, no parent in paid employment, and the local government area. In Australia, families with low incomes (A$798 [US $831] as of August 2012 combined weekly income for a couple with children) are eligible to receive a health care card, giving them access to government cost-supplemented prescription medications, health care, and concessions for housing amenities, transport, and education costs.

PROCESS MEASURES

The intervention was evaluated through feedback provided by parents and intervention maternal and child health nurses. A short evaluation survey regarding intervention utility, satisfaction, and effect was included with the study survey for intervention families at 3 to 4, 12, and 48 months. Intervention nurses provided similar brief written feedback at each time point, with more detailed overall feedback at 4 years. A number of fidelity measures were also instituted, such as nurse attendance at training sessions (where the activities and messages for each time point were reviewed in detail), time spent with family at each visit, and number of Let's Read intervention take-home packs distributed to families.

SAMPLE SIZE

We aimed to detect a 0.35-SD difference between the 2 trial arms for our outcome measures. We assumed an intracluster correlation coefficient for language and literacy outcomes of 0.04 based on the upper bound of the 95% CI for the intracluster

correlation coefficient of the vocabulary section of the Communicative Development Inventory Words and Sentences Inventory administered to 2-year-old children in a previous population-based study[43] and estimated that there would be 16 participating infants in each maternal child health cluster. We calculated that 352 participants and 22 maternal and child health nurse clusters were required in each trial arm for 90% power at the .05 level of significance; this includes 4 clusters that were added to each trial arm to allow for attrition.

STATISTICAL ANALYSIS

The trial arms were analyzed based on the intent-to-treat principle with participants who provided outcome data at 4 years analyzed according to the trial arm to which they were randomized. Comparisons, both unadjusted and adjusted for the listed potential confounders, used random-effects linear regression models estimated using maximum likelihood to allow for the correlation between outcomes of participants from the same cluster.[44] Responses on process measures were summarized using percentages.

RESULTS

Figure 2 shows the flow through the trial. A total of 630 children (66.5% of the 948 expressing interest and assessed for eligibility) were recruited from the 65 participating maternal and child health clusters. Compared with the general community demographic characteristics of the selected local government areas, our study sample had a slightly higher proportion of primary caregivers who had completed high school (79.6% vs 75.5%), were born in Australia (70.7% vs 63.3%), mainly spoke English at home (87.1% vs 68.3%), and had a lower proportion of health care card ownership (20.2% vs 24.5%) (**Table 2**).

A total of 33 maternal and child health clusters were randomized to the control arm (265 families) and 32 to the intervention arm (365 families). The trial arm sizes differ markedly because the number of families estimated before the trial to be eligible within clusters was sometimes highly inaccurate. Table 2 indicates that children in the intervention group were on average slightly older at recruitment, with slightly more boys and Australian-born parents. Retention rates were extremely high (Figure 2), with 328 of 365 (89.9%) of the intervention group and 235 of 265 (88.7%) of the control group providing outcome data for the final analyses.

LITERACY AND LANGUAGE OUTCOMES

Table 3 indicates that, in both unadjusted and adjusted comparisons, the intervention and control arms had similar outcomes at 4 years of age on all primary and secondary outcome measures, with similarly high scores for home literacy environment and practices in both groups. Results were similar when analyses were further adjusted for children's nonverbal cognitive ability.

PROCESS MEASURES

All of the intervention nurses attended each of the 3 training sessions. During the 4 time points, the nurses reported that, for most visits (69.2%), they spent 2 to 4 min-

Table 2. Sample Characteristics

Characteristic	Control (n = 265)[a]	Intervention (n = 365)[a]
Child		
Age at enrollment, mean (SD), wk	8.1 (3.9)	9.6 (4.5)
Male sex, No. (%)	125 (47.4)	203 (55.8)
Term gestation, No. (%)	206 (94.9)	287 (93.2)
KBIT-2 standard score, mean (SD)[b]	103.1 (13.7)	103.2 (12.9)
Primary caregiver		
Age at enrollment, mean (SD), y	32.1 (5.9)	31.6 (4.9)
Relationship status, No. (%)		
Married	196 (74.2)	281 (77.2)
De facto	57 (21.6)	67 (18.4)
Other	11 (4.1)	16 (4.4)
Born in Australia, No. (%)	184 (70.0)	274 (75.7)
Aboriginal/TSI, No. (%)	1 (0.4)	3 (0.8)
Completed high school, No. (%)	207 (79.6)	227 (76.5)
English main language spoken at home, No. (%)	225 (85.9)	318 (88.3)
SF-12 score, mean (SD)		
Physical health	52.6 (7.0)	51.9 (7.2)
Mental health	52.4 (8.0)	52.0 (7.2)
Secondary caregiver		
Age, mean (SD), y	34.9 (5.9)	34.4 (5.3)
Born in Australia, No. (%)	181 (70.7)	262 (75.7)
Aboriginal/TSI, No. (%)	1 (0.4)	0
Completed year 12 education, No. (%)	174 (68.0)	224 (64.9)
Family health care card, No. (%)	52 (19.8)	72 (20.1)
Parent		
Adult nonword repetition, mean (SD)	21.2 (3.7)	21.1 (3.8)
WRAT-4 reading standard score, mean (SD)	95.2 (11.1)	95.7 (10.6)
Mill Hill score, mean (SD)		
Mother	27.8 (5.7)	27.9 (5.3)
Father	30.5 (4.9)	29.2 (5.8)

Abbreviations: KBIT-2, Kaufman Brief Intelligence Test 2; SF-12, 12-Item Short-Form Health Survey; TSI, Torres Strait Islander; WRAT-4, Wide Range Achievement Test 4.
[a] Sample size ranges from 252 to 265 in the control arm and 348 to 365 in the intervention arm.
[b] Measure completed at the direct assessment at 4 years of age.

utes delivering the Let's Read messages, with 28.3% of visits requiring 5 to 10 minutes and only 2.4% of visits requiring more than 10 minutes with each family. Overall, 81.6% of intervention parents received at least 3 of the 4 intervention delivery points.

PARENT AND NURSE EVALUATION

There were modest parent ratings of the usefulness of various program elements and overall effect on literacy activities with their children (**Table 4**), with less than 50.0% rating the effect as "quite a bit" or "very much" for each activity. However, parents rated highly the program as a whole, with 95.9% saying they would recommend it to others and 81.7% reporting that each additional pack offered their family something different to do with their child.

Of the 20 intervention maternal and child health nurses (63.4%) who completed the feedback survey, 17 felt confident delivering Let's Read and 19 would recommend the program be incorporated into their normal routine practice. Overall, 95.7% thought that Let's Read was ef-

Table 3. Comparison of Primary Outcomes Between Trial Arms at 4-Year Follow-up

Outcome	Mean (SD)		Unadjusted I − C, Mean Difference	Adjusted I − C[b]		
	Intervention[a]	Control[a]		Mean Difference (95% CI)	P Value	ICC
Primary outcomes						
Child literacy, SPAT-R						
Intrasyllabic	7.0 (2.4)	6.8 (2.4)	0.2	0.2 (−0.2 to 0.6)	.29	0
Phonemic	5.4 (2.6)	5.4 (2.7)	−0.01	0.05 (−0.4 to 0.5)	.85	0
Letter awareness	9.3 (9.0)	9.6 (9.0)	−0.3	0.1 (−1.5 to 1.6)	.92	0
Child language, CELF-P2						
Core	99.0 (16.1)	97.8 (16.4)	2.0	1.6 (−1.1 to 4.3)	.25	0.02
Receptive	95.1 (15.6)	94.7 (15.1)	1.2	0.8 (−2.0 to 3.7)	.56	0.04
Expressive	99.1 (16.2)	98.4 (17.7)	1.9	1.4 (−1.4 to 4.2)	.32	0.01
Secondary outcomes						
Home literacy environment StimQ						
Parental involvement in developmental advance	10.6 (2.5)	10.7 (2.9)	−0.1	−0.1 (−0.6 to 0.4)	.75	0
Parental verbal responsivity	5.9 (1.2)	5.9 (1.3)	0.01	−0.02 (−0.2 to 0.2)	.87	0
Reading	15.2 (2.3)	14.9 (2.7)	0.3	0.3 (−0.1 to 0.7)	.13	0
Total	31.7 (4.5)	31.6 (5.3)	0.2	0.2 (−0.6 to 1.0)	.68	0
Home literacy practices						
Minutes spent reading to child						
Per weekday	35.3 (37.2)	36.3 (39.4)	−1.1	−1.9 (−8.4 to 4.7)	.57	0
Per weekend day	27.4 (27.4)	27.9 (25.6)	−0.5	−1.2 (−5.6 to 3.1)	.58	0
Minutes child enjoys being read to						
Per weekday	36.1 (36.4)	37.2 (34.8)	−1.4	−1.2 (−7.6 to 5.1)	.71	0.004
Per weekend day	30.1 (32.3)	29.8 (26.6)	0.3	−0.01 (−5.2 to 5.1)	>.99	0
Minutes spent teaching letters and words						
Per weekday	19.3 (31.5)	19.1 (30.2)	0.1	−0.01 (−4.8 to 4.8)	>.99	0
Per weekend day	13.8 (23.8)	13.5 (20.5)	0.3	−0.4 (−4.3 to 3.6)	.86	0.03
Minutes spent helping read letters and words						
Per weekday	24.2 (37.6)	22.0 (33.7)	1.8	2.9 (−2.7 to 8.4)	.31	0
Per weekend day	17.4 (29.5)	16.1 (22.2)	1.1	−0.1 (−4.4 to 4.1)	.95	0.001

Abbreviations: CELF-P2, Clinical Evaluation of Language Fundamentals–Preschool, Australian Second Edition; I − C, intervention minus control; ICC, intracluster correlation coefficient; SPAT-R, Sutherland Phonological Awareness Test Revised.

[a]Sample size ranged from 214 to 228 in the control arm and 296 to 314 in the intervention arm for the unadjusted analyses and from 199 to 211 in the control arm and 274 to 285 in the intervention arm for adjusted analyses.

[b]Adjusted for parent mental health, child's sex, whether English was the main language spoken at home, the primary caregiver's (usually the mother's) level of education, health care card status (pensionlike status), no parent in paid employment, and the local government area.

fective in promoting children's literacy and language development.

COMMENT

This multiple–time point literacy promotion program was feasible to administer from a universal primary care platform throughout the first 3½ years of life in relatively disadvantaged communities and was highly recommended by parents and nurses alike when provided to families through maternal and child health nurses. We found no measurable improvement in emergent literacy and language outcomes or literacy activities at 4 years of age. Home literacy environments were strong in both the control and intervention group families, possibly limiting the literacy and language gains from the low-intensity Let's Read program.

Important methodologic strengths include the trial's randomized design, high uptake by families, and provision by maternal and child health nurses throughout the targeted disadvantaged regions and extremely high retention rate in both arms at 4 years after randomization. Selection bias was prevented by enrolling families before randomization, and contamination was minimized through clustering by maternal and child health centers.[46] The intervention materials were evidence based, easy to deliver, and well understood by nurses and families. Victoria's well-established universal primary care system means that a trusted and well-supported health care professional could perform the intervention through the entire period spanning infancy to preschool. Outcome assessments were conducted by research assistants who were masked to the child's trial allocation status and who were not involved in recruitment.

The trial had some limitations. First, although the intervention was implemented solely within Melbourne's more disadvantaged communities, parent factors, such as their high rates of high school completion and mean reading scores well within the average range, suggest that the families who entered the trial were among the more

Table 4. Process Measures Reported by Intervention Parents When Their Child Was 4 Years of Age

Measure	Quite a Bit/ A Great Deal, No. (%) of 302 Respondents
Has the program changed . . .?	
How often you read to your child?	86 (28.4)
How often your child asks for a book to be read?	98 (32.6)
How you communicate with your child?	87 (28.7)
How often other people, such as partner, babysitters, or other relatives, read with your child?	59 (19.4)
Has the program changed your opinion or behaviors in any of these areas?	
The idea that children can enjoy and benefit from books at an early stage?	116 (38.4)
To establish a regular shared reading routine?	114 (37.7)
To point to words as you read?	124 (41.2)
To point to and describe pictures while reading?	118 (39.0)
To ask your child to name what they see?	116 (38.4)
To visit your local library?	56 (18.4)
How useful was . . .	
The discussion with your MCH nurse?	44 (14.5)
The parent information leaflet	111 (36.6)
The "book suggestions" leaflet?	146 (48.3)
Overall	
How useful was the Let's Read program?	186 (61.5)

Abbreviation: MCH, maternal child health.

advantaged in their regions. Second, although previous US studies[47] of early literacy promotion were targeted to Latino families, our results may not generalize to parents with no or limited English because we did not have resources to translate the trial's materials or engage interpreters. Study materials were, however, produced at a sixth-grade reading level to increase the likelihood that more families of low English literacy would participate, and a small number of families for whom English was a second language participated successfully. Third, for the small number of intervention families who did not attend one of the specific maternal and child health nurse visits, the intervention was delivered via the telephone, which may not be as effective as face-to-face discussion.

Ultimately, Let's Read was a low-intensity intervention provided by well-child care nurses 4 times in the first 4 years of life to children who, although residing in relatively disadvantaged geographic areas, were themselves not especially disadvantaged. Programs that have demonstrated some effect on language and/or literacy activities, such as Reach Out and Read (a similar but more intensive approach), Home Interaction Program for Parents and Youngsters[19] (a highly targeted preschool home tutoring program), and Little by Little (a clinic-based intervention for families in receipt of the US-based Special Supplemental Nutrition Program for Women, Infants, and Children),[24] typically have 10 to 16 intervention time points and work with much more disadvantaged families. Our trial does not address the question of whether a more intensive intervention, such as Reach Out and Read, would be useful at the population level but suggests that were this to be contemplated it should be rig-

orously evaluated. We were also not able to address the efficacy of our low-intensity program had it reached a more genuinely disadvantaged group.

Our results suggest that a less intensive, more universal approach to early literacy promotion has no measurable effect on emergent literacy or language outcomes, although it appears to do no harm. However, a more highly targeted program may fail in reach and/or uptake in the absence of a universal literacy promotion platform. Rather than dismiss the need for universal approaches (which we have shown can be feasibly provided through health care settings), health promotion and equity principles[48,49] suggest it may still be an appropriate platform from which to effectively target population reach, dose, and intensity. The issue of balancing these sorts of opportunity costs against population outcome gains remains a thorny predicament for governments.

The long-term outcomes of this trial indicate that universal low-intensity book distribution and literacy promotion programs are unlikely to provide value for money on their own. Future research could examine how best to reach more disadvantaged families, the minimum intensity that reliably makes a difference (including the threshold of when to distribute free books and hence how best to manage the costs when calculated at a population level), and whether the efficacy of targeted programs increase when provided from a universal platform.

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