Video-Based Anticipatory Guidance on Early Cognitive and Language Development in the First 6 Months: A Randomized Controlled Trial

Christy Y. Y. Leung, PhD[1], Jose Eos Trinidad, MA[2], and Dana L. Suskind, MD[1]

This randomized controlled trial showed that video-based anticipatory guidance implemented at well-child visits in the first 6 months increased knowledge of early cognitive and language development ($P < .001$), which in turn promoted cognitive growth fostering behaviors among parents of low socioeconomic status (95% CI 0.09-0.57). *(J Pediatr 2022; ■:1-3).*

Trial registration ClinicalTrials.gov: NCT02812017

Parental knowledge shapes the early environment they provide for their children and ultimately contributes to their children's developmental outcomes.[1] Research with parents from low socioeconomic status (SES) backgrounds shows that those who better understand development as early as the first week of life are more likely to foster their infant's social-emotional and cognitive growth at 9 months.[2] Thus, supporting parents with knowledge and strategies promoting infant cognitive development in the first year is important to address educational inequity and health disparities.[3] Although well-child visits provide a universal touchpoint to support parents, time constraints and inadequate resources are the major barriers for pediatric and family medicine practitioners (including physicians, nurse practitioners, and physician assistants) to disseminating anticipatory guidance on early brain and language development.[4] Thus, we developed and tested video-based anticipatory guidance intervention that aligned with the American Academy of Pediatrics Bright Futures Guidelines[5] and focused on early cognitive and language development. This series of four 10-minute interactive video modules for well-child visits during the first 6 months was designed to promote parental knowledge of early brain growth and language learning, and provide parents with strategies to enrich home language environments. We examined whether the video-based anticipatory guidance would increase knowledge of early cognitive and language development, which in turn promote cognitive growth fostering behaviors among parents of low-SES.

Methods

This randomized-controlled trial (NCT02812017, registered at https://clinicaltrials.gov/) was conducted in 10 pediatric clinics predominantly serving families of low-SES in Chicago. A convenience sample of parent-infant dyads was recruited at the 1-week well-child visit. Parents were eligible if they had a household income at or below 200% of the federal poverty line, did not receive education beyond the bachelor's level, spoke English and/or Spanish, were at least 18 years old, and their infants were born at a minimum of 36 weeks of gestation without significant perinatal or neonatal complications or medical diagnoses. Parents were ineligible if they were foster parents, did not live with the infant, or their infant was older than 1 month of age at enrollment. Signed written consent was obtained by the research assistant from parents before parents reported demographics at the 1-week visit (baseline).

Parent-infant dyads were randomized by the lead research assistant into either the intervention (video-based anticipatory guidance on early cognitive and language development) or control (sudden infant death syndrome video or usual-care) condition, using block randomization method. Research Randomizer (Randomizer.org)[6] was used to generate a set of unique unsorted numbers and each unique number was paired with a participant number. The first one-half of the unique unsorted numbers was assigned to intervention and the second one-half to control. Parents were blind to the alternative condition. Using a tablet provided by a research assistant, parents in the intervention condition watched 1 video-based anticipatory guidance module at the 1-month, 2-month, 4-month, and 6-month well-child visits. Parents in both conditions completed the Survey of Parent/Provider Expectations and Knowledge[7] at the 1-week and 6-month visits to assess their knowledge about the role of caregiver responsiveness and inputs in young children's cognitive and language development. Their cognitive growth fostering behaviors were assessed during a 5-minute teaching task with their infant at the 9-month visit, by certified research assistants who obtained the required 90% interrater

SES	Socioeconomic status

From the [1]TMW Center for Early Learning + Public Health, and [2]Departments of Sociology and Comparative Human Development, University of Chicago, Chicago, IL

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reliability, using the revised Nursing Child Assessment Satellite Training[8] Teaching Scale. All research materials were presented in parents' preferred language (English or Spanish). Parents received up to $150 compensation for participating in all study activities. The University of Chicago Medicine Biological Sciences Division Institutional Review Board approved this study (IRB#15-0914).

Previous findings[9] were used to estimate the effect size of intervention impact on parental knowledge. A minimum sample size of 400 participants at baseline was required for a target power threshold of 80%, a 2-tailed significance level of 5%, and an anticipated attrition rate of 25%. A mediation model was tested using the PARAMED function in STATA MP/14 (StataCorp LP), applying 1000 bootstrap resamples with 95% bias-corrected CI estimated around the indirect effect of knowledge of early cognitive and language development on the intervention impact on cognitive growth fostering behaviors.

Results

Enrollment was conducted by the research assistant between June 22, 2016 and August 1, 2017. Sample included 340 parent-infant dyads (168 intervention and 172 control); see consort diagram in Figure 1. Two-thirds of the intervention parents watched all 4 videos and one-fourth watched 3 videos. Given that the number of videos watched was not significantly associated with the study variables, all parents were included, with a total sample size of 340 for the mediation analysis. Sociodemographic characteristics

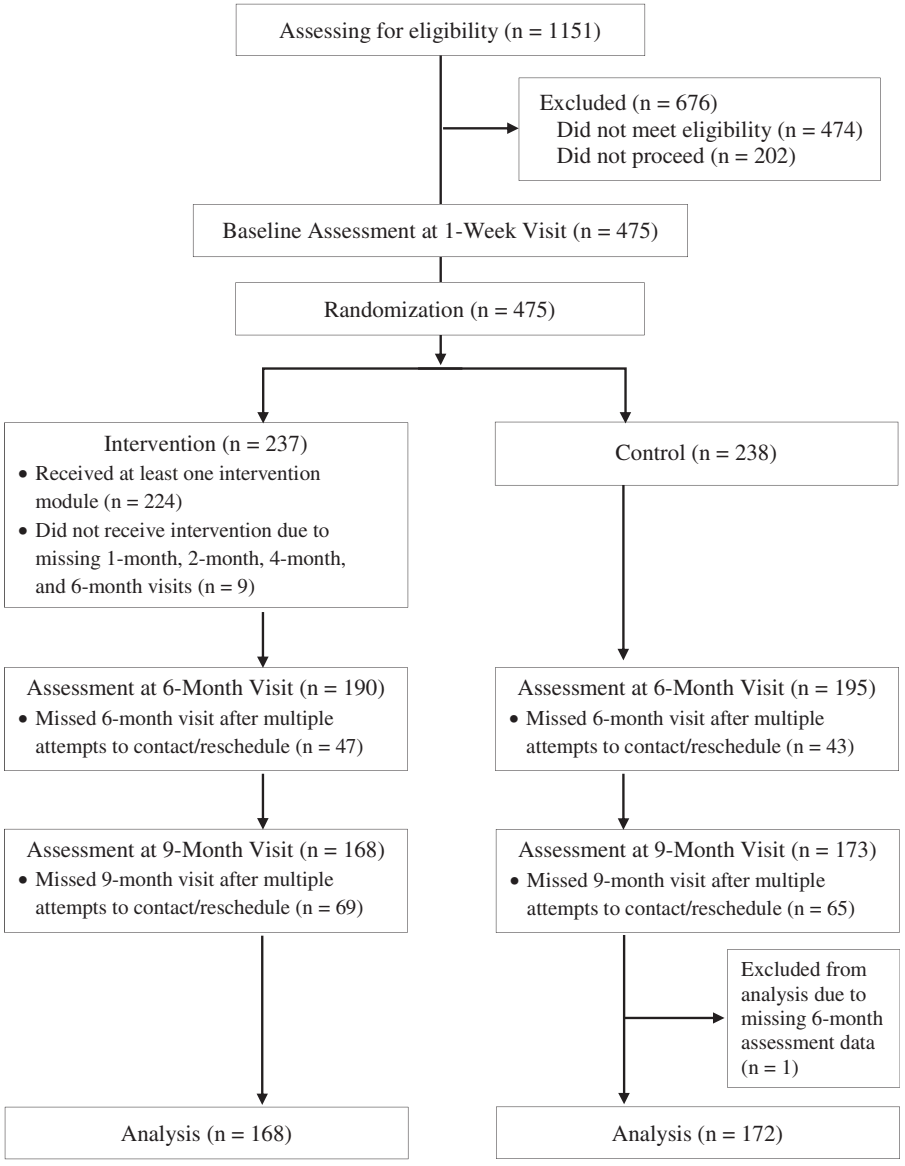

Figure 1. CONSORT flow diagram illustrating each stage of the randomized controlled trial.

and parental knowledge at baseline were not significantly different across the 2 conditions (baseline demographics are described in the **Table**; available at www.jpeds.com). Preliminary correlation analysis revealed that parental employment status (employed vs unemployed) and primary language (English vs non-English) were significantly correlated with parental cognitive growth fostering behaviors ($r = .13$, $P < .05$ and $r = -.24$, $P < .001$, respectively). These 2 variables were, therefore, examined as covariates in the mediation model. Parental knowledge fully mediated the intervention impact on parental cognitive growth fostering behaviors (total effect *c*: $\beta = 0.22$, $P < .05$; direct effect *c'*: $\beta = 0.12$, $P > .05$) (**Figure 2**). Parents who received the intervention had more knowledge at 6 months (*a*: $\beta = 0.67$, $P < .001$). More knowledge at 6 months in turn predicted more cognitive growth fostering behaviors at 9 months (*b*: $\beta = 0.15$, $P < .01$). The indirect effect of the intervention on behaviors through knowledge was significant (*ab*: $\beta = 0.10$, $P < .01$, 95% CI 0.09-0.57). Results indicated that the video-based anticipatory guidance on early cognitive and language development significantly enhanced parental knowledge, which in turn promoted their cognitive growth fostering behaviors.

Discussion

The present study shows the potential of implementing video-based programs as an opportunity to support pediatric and family medicine practitioners in disseminating anticipatory guidance focused on early childhood cognitive development. Parents of low-SES significantly gained knowledge of early childhood cognitive and language development from the video-based anticipatory guidance intervention. As a result, those parents provided more cognitive stimulations and language inputs for their infants early in life. These findings highlight the possibility of utilizing the video-based anticipatory guidance as a primary pediatric care routine to promote cognitive growth fostering among parents of all SES. Nevertheless, the video-based anticipatory guidance intervention was implemented using a one-size-fits-all approach without considering the heterogeneity among parents.[2,10] Moreover, parental cognitive growth fostering behaviors were assessed based on a 5-minute teaching task during a well-child visit without examining whether the intervention would promote parents' positive caregiving behaviors in their natural home environments. Despite these limitations, the present study demonstrates the potential of implementing video-based anticipatory guidance at pediatric care. This study also underscores the importance of providing parents with anticipatory guidance on infant brain and language development early in the perinatal period through well-child care to better support parents in fostering language-rich milieus for their young children. ■

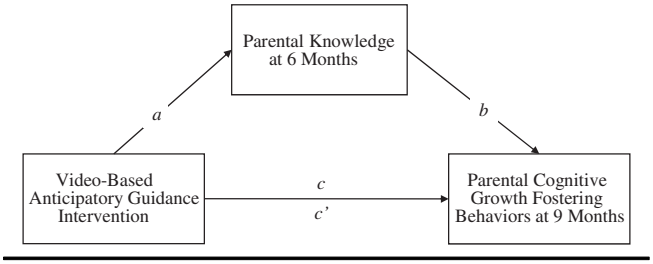

Figure 2. Mediation model testing the indirect effect of parental knowledge at 6 months on the impact of video-based anticipatory guidance intervention on parental cognitive growth fostering behaviors at 9 months. Parental employment status and primary language were examined as covariates. The impact of intervention on knowledge (*a* path), impact of knowledge on behaviors (*b* path), total effect of intervention on behaviors (*c* path), direct effect of intervention on behaviors, controlling for knowledge (*c'* path), and the indirect effect of the intervention on behaviors mediated by knowledge (*ab* path) were estimated.

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Reprint requests: Dana L. Suskind, MD, TMW Center for Early Learning and Public Health, University of Chicago, 5841 S Maryland Ave, MC 1035, Chicago, IL 60637. E-mail: dsuskind@surgery.bsd.uchicago.edu

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Table. Baseline characteristics of the intervention and control parent-child dyads

	Intervention	Control
Sample size	168	172
Parent age (mean, SD)	27.26 (6.1)	26.13 (5.8)
Race/ethnicity		
Non-Hispanic African American	80 (47.6)	61 (35.5)
Non-Hispanic European American	7 (4.2)	3 (1.7)
Hispanic, any race	75 (44.6)	103 (59.9)
Primary language		
English	118 (70.2)	105 (61.1)
Spanish	44 (26.2)	64 (37.2)
Marital status		
Single	84 (50.0)	81 (47.1)
Married	38 (22.6)	44 (25.6)
Education level		
Some high school or below	45 (26.8)	53 (30.8)
High school graduate or equivalent	60 (35.7)	66 (38.4)
Some college credit or postsecondary nondegree program	43 (25.6)	36 (20.9)
Two-y associate degree	7 (4.2)	7 (4.1)
Four-y bachelor's degree	10 (6.0)	8 (4.7)
Employed	122 (72.6)	118 (68.6)
LINK/WIC recipient	135 (80.4)	132 (76.7)
Child sex		
Female	96 (57.1)	93 (54.1)
Male	72 (42.9)	79 (45.9)

LINK, Illinois Link program; *WIC*, Women, Infants, and Children program.
Frequency and proportion are reported in the Table except as otherwise noted.