

Educating Parents About Infant Language Development: A Randomized Controlled Trial

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Abstract

A total of 427 women (aged 18–45 years) who delivered a singleton neonate without serious medical complications were randomized to watch either an educational intervention (n = 225) or the sudden infant death syndrome (n = 202) video. Linear mixed models showed that the intervention women significantly gained knowledge over time. Knowledge gain was largest among high-socioeconomic status (high-SES) and middle-SES English-speaking, smaller among low-SES Spanish-speaking, and nonsignificant among low-SES English-speaking women. Analysis of deviance revealed that the intervention women of all SES learned strategies fostering secure attachment and language acquisition. Participants considered watching an educational video alongside the universal newborn hearing screening (UNHS) conveniently timed. The intervention women were more likely than the control women to recognize the importance of timely UNHS follow-up.

Keywords

parent education, knowledge of early childhood cognitive and language development, brain development, secure attachment, universal newborn hearing screening

Introduction

Social and language experiences in the first 3 years of life are critical for foundational infant brain development and language acquisition.^{1,2} Particularly important are caregiver sensitivity and responsiveness, which provide infant-directed social and conversational interactions.^{3,4} Socioeconomic disparities in this early learning milieu contribute to differences in brain development and language skills that can be seen as early as the age of 18 months, and that ultimately lead to school readiness and academic achievement gaps.^{5–7}

Parental understanding of early childhood development can significantly enhance the quality of social interactions and language exposure.^{8,9} Conversely, media use adversely affects the quality of social interactions and language environments,¹⁰ including parent-child interactions, parent language input, and early child vocalization.^{11,12} Thus, increasing parental knowledge about young children's development and the potentially adverse consequences of media exposure are important steps in fostering early childhood cognitive and language development.

The hospitalization that occurs immediately postpartum provides a unique opportunity to disseminate education and enriching strategies for early childhood cognitive and language development. Yet, while existing postpartum education predominantly focuses on breastfeeding, infant physical development, safe sleep environments, and/or car seat safety, it is less focused on infant cognitive and language development.^{13,14}

The TMW Initiative Newborn Curriculum (TMW-Newborn)¹⁵ was designed as a cost-effective, scalable intervention that could be implemented in conjunction with a standard assessment, the universal newborn hearing screening (UNHS), and could overcome the deficit in education regarding early brain development.

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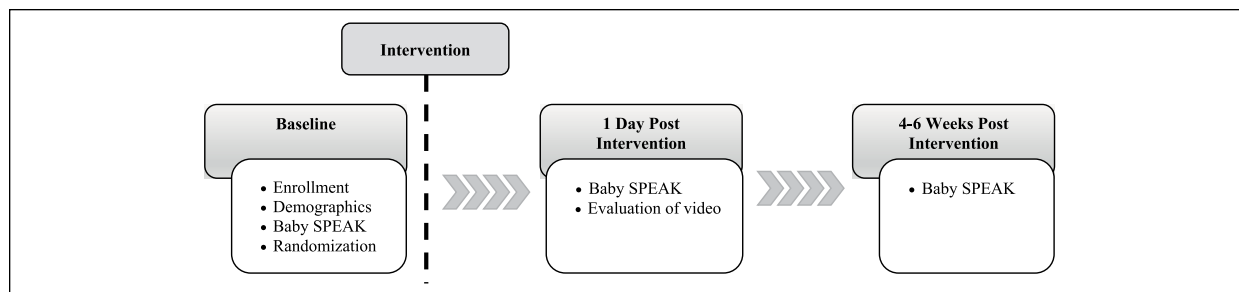


Figure 1. Study overview.

Moreover, because of its emphasis on early language exposure, the TMW-Newborn may help parents recognize the importance of timely follow-up for infants who do not pass the initial UNHS.

Using a randomized controlled trial design, the present study assessed whether the TMW-Newborn intervention: (1) increased knowledge about infant cognitive and language development, and the role of caregivers and their social interactions in optimizing infant development; (2) provided retainable information and concrete strategies for fostering infant nascent abilities, secure attachment, socioemotional competence, and language development; (3) could be delivered in conjunction with the UNHS; and (4) raised awareness about the importance of timely follow-up for infants who did not pass the initial UNHS.

Methods

Study Design

The study was a parallel-group, single-blind randomized controlled trial, conducted in conjunction with the UNHS assessment at the University of Chicago Medicine and Northwestern Memorial Hospitals between September 2015 and October 2016. The study was approved by the Biological Sciences Division Institutional Review Board at the University of Chicago Medicine (14-0990) and the Institutional Review Board at Northwestern University (STU00201058).

Participants

Women were eligible for the trial if they were at least 18 years old and delivered a singleton neonate at either of the 2 hospitals. They were excluded if they experienced serious medical complications during birth, had a child admitted to the neonatal intensive care unit, had an event during the delivery that would preclude the ability for the mother to participate (e.g., intubation), or had a primary language other than English or Spanish. Eligible

participants were classified into 3 levels of socioeconomic status (SES) based on household income and/or education. Participants with a household income at or higher than 400% of the Federal Poverty Line (FPL) were classified as high-SES, whereas participants with a household income at or below 200% of the FPL and no more than a 4-year college degree were classified as low-SES. Participants who did not fit into the criteria for high- or low-SES were considered to be of middle-SES. Moreover, participants were given the option to watch the video in either English or Spanish. Hence, in addition to classifying participants into 3 levels of SES, the intervention effect was separately examined in English- and Spanish-speaking participants.

Women were approached to participate on the first or second postpartum day. After signing informed consent, participants completed a demographic questionnaire and a revised version of the Survey of Parental Expectations And Knowledge focusing on infants (Baby SPEAK). The Baby SPEAK is a questionnaire (with each item rated on a 5-point Likert-type scale, ranging from 0 (*strongly disagree*) to 4 (*strongly agree*)) designed to measure parental knowledge about infant brain, cognitive, and language development (Appendix). Participants were then randomly assigned to watch either the intervention (TMW-Newborn) or control video using the coin flip option at the <http://random.org> website. The control video provided information about sudden infant death syndrome (SIDS). On the following day, participants again completed the Baby SPEAK and an additional 8-item survey that assessed their evaluation of the video; 4 to 6 weeks later they completed the Baby SPEAK a third time (see study overview in Figure 1). On completion of the study, participants received \$40 compensation, and were given internet access to both videos.

Intervention

TMW Initiative Newborn. The TMW Initiative Newborn Curriculum (TMW-Newborn) is a 10-minute, video-based intervention tailored for parents of newborns with

3 key messages: (1) the UNHS is a critical component of early care because language exposure from birth is essential to infant brain, language, and socioemotional development; (2) high-quality language environments promote infant brain development, cognitive functioning, and communication and language skills; and (3) parents play a critical role in fostering infant nascent abilities, secure attachment, socioemotional competence, and language development through caregiving sensitivity and language input.

Sudden Infant Death Syndrome. The Safe Sleep for Your Baby Video,¹⁶ part of the National Institute of Child Health and Human Development's Safe to Sleep Public Education Campaign, is a 10-minute video designed to educate parents about ways to reduce the risk of SIDS and other sleep-related causes of infant death. The SIDS video contains useful information for parents of newborns without tapping into any content presented in the TMW-Newborn video.

Statistical Analyses

Chi-square tests and 2-sample *t* tests were conducted to examine whether the TMW-Newborn and control participants were similar in terms of their demographics characteristics at baseline.

Linear mixed models (LMM) were applied to test whether the intervention significantly increased knowledge of infant cognitive and language development, and allows the incorporation of repeated measurements over time. The first LMM tested the intervention effect over time regardless of SES/language; the second LMM examined whether the magnitude of the intervention effect differed by SES/language. *P* values were calculated using *t* tests with appropriate degree-of-freedom estimates.¹⁷ All tests were 2-tailed and statistical significance was defined by $P < .05$.

Analysis of deviance was performed to test whether the intervention had a significant impact on responses to the evaluation questionnaire. Nested models tested whether responses to the 8 items were significantly impacted by (1) treatment condition, (2) SES/language, and (3) treatment condition * SES/language interaction.¹⁸

Multiple imputation (MI) was applied to impute missing data on the Baby SPEAK items, under the assumption that the data were missing at random in association with SES/language, treatment condition, and time point under a multivariate Gaussian distribution. MI extrapolates missing data based on simulations of the scores participants would have had if they had completed the questionnaire. Analysis of an imputed dataset reduces the

potential bias introduced by attrition or missing data, improving the accuracy of effect sizes and *P* values.¹⁹ All analyses were conducted in R,²⁰ using the packages "lme4" for LMM,²¹ "pbkrtest" for Kenwood-Roger *P* values,²² and "Amelia" for multiple imputation.²³

Sample Size and Power

A sample size of at least 50 participants in each subgroup by condition and SES/language was required to have 80% power to detect at least a 4-point difference in the total score of the Baby SPEAK survey, with a 2-sided alpha of .05, an estimated standard deviation of 10 points, and an anticipated attrition rate of 20%.

Results

A total of 427 women (aged 18-45 years) enrolled in the trial. High- and middle-SES participants all had English as their primary language; the primary language of low-SES participants was either English or Spanish. Given this distribution, effect modification was examined according to four groups: high and middle SES, and low SES according to primary language (i.e., English or Spanish). Participants in the two randomized groups were similar with respect to SES, primary language, and other baseline characteristics (see baseline characteristics in Table 1).

Prior to randomization, participants were asked whether health professionals (e.g., doctor, nurse, and midwife) ever had talked with them about their baby's language development. A majority of the participants (94%) indicated that no health professional had done so.

The Baby SPEAK survey was not completed by 11 (2%) participants immediately postpartum and 85 participants (20%) 4 to 6 weeks postpartum due to early discharge from the hospital or lack of response to follow-up communications. To account for potential bias due to missing data, results with and without MI are reported in Table 3.

Effectiveness of the Intervention

Overall Intervention Effect. Means and standard deviations of the Baby SPEAK score are described in Table 2. Results from the LMM are reported in Table 3. TMW-Newborn and control participants did not significantly differ on their levels of knowledge at baseline (Table 3). The participants randomized to the TMW-Newborn group, however, had a significant increase in their knowledge 1 day as well as 4 to 6 weeks postintervention relative to their control counterparts (LMM 1, Table 3, intervention * time interaction).

Table 1. Baseline Characteristics of the TMW-Newborn (Intervention) and the SIDS (Control) Participants.^a

	TMW-Newborn	Control	<i>p</i> ^b
Sample size	225	202	
Education			.46
No high school	12 (.05)	15 (.07)	
High school or equivalent	41 (.18)	46 (.23)	
Some college	69 (.31)	65 (.32)	
Bachelor's degree	49 (.22)	37 (.18)	
Master's degree or higher	54 (.24)	39 (.19)	
Race/Ethnicity			.22
Asian or Pacific Islander	20 (.09)	18 (.09)	
Black	60 (.27)	45 (.22)	
Hispanic	43 (.19)	46 (.23)	
White	60 (.27)	41 (.20)	
SES/Language			.43
High SES–English	53 (.24)	37 (.18)	
Middle SES–English	76 (.34)	64 (.32)	
Low SES–English	53 (.24)	55 (.27)	
Low SES–Spanish	43 (.19)	46 (.23)	
Married	123 (.55)	109 (.54)	.96
Employed	149 (.66)	118 (.58)	.12
LINK	167 (.74)	141 (.70)	.36
WIC	133 (.59)	120 (.59)	1.00
Family size (mean)	3.85	3.95	.42

Abbreviations: TMW-Newborn, TMW Initiative Newborn Curriculum; SIDS, sudden infant death syndrome; SES, socioeconomic status; LINK, Illinois Link program; WIC, Women, Infants and Children program.

^aFrequency and proportion are reported in Table 1 except as otherwise noted.

^bChi-square tests and 2-sample *t* tests revealed no significant differences between TMW-Newborn and control participants in terms of their demographics characteristics at baseline.

Intervention Effect Across SES/Language. SES was positively associated with knowledge at baseline. High-SES participants had the highest levels of knowledge, whereas low-SES participants had the lowest at baseline (LMM 2, Table 3). The magnitude of the intervention effect varied across SES/language groups. Increases in knowledge related to the intervention were large and significant among high-SES and middle-SES English-speaking participants. Increases in knowledge were small yet significant among low-SES Spanish-speaking participants. Increases in knowledge were not significant among low-SES English-speaking participants. Close similarities in the magnitude of the intervention effect between 1 day and 4 to 6 weeks postintervention within each SES/language group confirmed that the impact of the intervention on knowledge sustained over

time. Results with and without MI are similar, adding confidence that the intervention results were not substantially biased by missing data or attrition.

Evaluation of the Intervention

Evaluation of the Content. Responses to the evaluation questionnaire are reported in Table 4; results of the analysis of deviance are reported in Table 5. The TMW-Newborn participants were significantly more likely than their control counterparts to consider information in the video useful, report learning new information from the video, express willingness to recommend the video to a friend, and plan to apply what they had learned from the video at home.

Evaluation of the Implementation. Almost all participants (96%) indicated that someone had spoken to them about the results of their infants' Hearing Screening, and that they understood what those results meant for them and their infants. The TMW-Newborn participants were significantly more likely than their control counterparts to recognize the importance of timely follow-up for infants who did not pass the UNHS. High-SES participants were significantly more likely than other participants to recognize the importance of timely follow-up. Low-SES participants were significantly more likely than their high-SES and middle-SES counterparts to consider watching the video in conjunction with the UNHS convenient to them.

Discussion

Language environment and caregiver sensitivity during the first year of life are critical for infant brain development, acquisition of communication skills, and secure bonding with caregivers.¹⁻⁴ While health professionals could play a key role in disseminating information on infant brain development, a large majority of the mothers in this sample reported having no communication with any health professionals about their newborn's language development. This finding speaks to the need to develop systems that allow routine dissemination of information about the importance of language exposure and caregiving sensitivity in fostering infant cognitive and language development. One period that is particularly amenable to such dissemination is that of perinatal and postpartum care.

The present study was a randomized controlled trial testing the effectiveness of the TMW-Newborn intervention. Results showed that mothers who received the TMW-Newborn intervention significantly gained knowledge about early language environments and caregiver responsiveness in promoting infant cognitive and

Table 2. Means and Standard Deviations of Baby SPEAK Score of the TMW-N (Intervention) and the SIDS (Control) Participants by SES/Language Over the 3 Time Points.

Time Point	High-SES English		Mid-SES English		Low-SES English		Low-SES Spanish	
	TMW-N	Control	TMW-N	Control	TMW-N	Control	TMW-N	Control
Baseline	65.67 (7.34)	65.08 (6.89)	61.61 (7.14)	61.75 (9.65)	57.99 (9.30)	59.46 (7.82)	57.35 (8.13)	54.29 (8.07)
1 day postintervention	71.78 (6.74)	65.94 (7.21)	67.52 (7.08)	62.59 (9.69)	59.65 (11.28)	59.53 (8.43)	60.06 (9.43)	54.96 (9.16)
4-6 weeks postintervention	71.18 (7.06)	66.96 (7.15)	68.18 (7.10)	63.49 (9.20)	61.58 (9.86)	60.92 (8.68)	60.37 (8.54)	56.57 (8.65)

Abbreviations: TWM-N, TMW Initiative Newborn Curriculum; SIDS, sudden infant death syndrome; SES, socioeconomic status.

Table 3. Results of the 2 Linear Mixed Model Analyses.^a

	No Imputation				Multiple Imputation			
	B	SE	β^b	P	B	SE	β^b	P
Linear mixed model 1. Overall intervention effect								
Baseline	57.61	0.64	6.51	<.001	57.61	0.64	6.51	<.001
TWM-N	0.49	0.88	0.06	.576	0.49	0.88	0.06	.576
T2	0.38	0.40	0.04	.338	0.38	0.40	0.04	.338
T3 ^a	1.23	0.43	0.14	.005	1.23	0.43	0.14	.005
TWM-N * T2	3.65	0.55	0.41	<.001	3.65	0.55	0.41	<.001
TWM-N * T3	3.20	0.60	0.36	<.001	3.20	0.60	0.36	<.001
Linear mixed model 2. Intervention effect by SES/language								
highSES-Eng	65.40	1.30	7.39	<.001	65.39	1.70	7.39	<.001
middleSES-Eng	62.02	1.08	7.01	<.001	61.93	1.17	7.00	<.001
lowSES-Eng	59.17	1.00	6.69	<.001	59.18	1.01	6.69	<.001
lowSES-Span	54.11	1.18	6.11	<.001	54.23	1.40	6.13	<.001
highSES-Eng * TWM-N	0.26	1.74	0.03	.882	0.27	3.06	0.03	.931
midSES-Eng * TWM-N	-0.63	1.59	-0.07	0.696	-0.44	2.53	-0.05	1.139
lowSES-Eng * TWM-N	-1.17	1.39	-0.13	.405	-1.18	1.96	-0.13	1.453
lowSES-Span * TWM-N	3.24	1.75	0.37	.067	3.14	3.08	0.35	.309
T2	0.54	0.41	0.06	.191	0.56	0.17	0.06	.001
T3 ^a	1.33	0.45	0.15	.003	1.51	0.21	0.17	<.001
highSES-Eng * TWM-N * T2	5.64	0.90	0.64	<.001	5.53	0.84	0.63	<.001
highSES-Eng * TWM-N * T3	4.28	0.95	0.48	<.001	3.99	0.91	0.45	<.001
middleSES-Eng * TWM-N * T2	5.38	0.92	0.61	<.001	4.96	0.86	0.56	<.001
middleSES-Eng * TWM-N * T3	5.04	0.96	0.57	<.001	4.30	0.94	0.49	<.001
lowSES-Eng * TWM-N * T2	1.27	0.78	0.14	.107	1.24	0.64	0.14	.051
lowSES-Eng * TWM-N * T3	1.23	0.85	0.14	.150	0.94	0.73	0.11	.198
lowSES-Span * TWM-N * T2	2.20	0.97	0.25	.025	2.18	0.99	0.25	.028
lowSES-Span * TWM-N * T3	1.95	1.12	0.22	.086	1.99	1.21	0.23	.100

^aT2 indicates 1 day postintervention; T3 indicates 4 to 6 weeks postintervention; TWM-N indicates assignment to the TMW Initiative Newborn Curriculum intervention.

^bStandardized (β) coefficients are based on a preintervention standard deviation of 8.85 points.

language development; such impact on knowledge was sustained over time. This intervention addressed limitations of the current postpartum educational system and provided mothers with new, helpful information on infant brain development and language learning.

Specifically, the mothers in the TMW-Newborn group learned about concrete, easy-to-apply strategies in providing sensitive caregiving and quality language input for their infants. Results also suggested that these mothers were receptive to the intervention as they expressed

Table 4. Responses in the Evaluation of Video Across Treatment Condition and SES/Language.^a

Statements in the Evaluation Survey	High-SES English		Mid-SES English		Low-SES English		Low-SES Spanish	
	TMW-N	Control	TMW-N	Control	TMW-N	Control	TMW-N	Control
1. I found the information in the video useful.	0.98	0.89	1.00	0.95	0.99	0.96	1.00	0.94
2. I learned something new from watching the video.	0.98	0.58	0.96	0.84	1.00	0.86	0.98	0.92
3. I would recommend this to a friend.	1.00	0.72	0.98	0.88	0.97	0.99	1.00	0.96
4. Are you planning on doing anything you saw in the video at home?	1.00	0.86	1.00	0.84	0.91	0.80	1.00	0.94
5. It was a convenient time to watch the video.	0.83	0.75	0.92	0.88	0.96	0.91	1.00	0.94
6. Someone spoke to me about the results of my infant's Hearing Screening.	1.00	0.94	0.98	0.96	0.97	0.94	0.96	0.94
7. I understand what the results of the Hearing Screening mean for me and my infant.	0.98	0.89	1.00	0.93	0.96	0.96	0.98	0.98
8. If an infant does not pass the Hearing Screening, it's best to wait until the infant is older to follow up.	0.89	0.72	0.77	0.68	0.64	0.61	0.72	0.60

^aResponses indicating "Yes/Agree" in items 1 to 7 and "Disagree" in item 8 across condition and SES/language are reported in proportion. For item #4, if participants indicated planning to apply what they saw in the video at home, they were then asked to provide open-ended responses to describe what they planned on doing. Themes emerged from open-ended responses regarding what participants would do at home based on the information they had learned from the TMW-N (TMW-Newborn) video: talking/reading more with infants; using gentle tone when talking with infants; being responsive to infant cues or crying; making eye contact with infants; speaking in their native (non-English) language with infants; limiting/monitoring media use; sharing techniques with family members or other caregivers.

Table 5. Results of the Analyses of Deviance Examining the Main Effects of Treatment Condition and SES/Language as Well as the Treatment Condition * SES/Language Interaction on the Evaluation of Video.^a

	Condition (df = 1)	SES/Language (df = 3)	Condition * SES/Language (df = 3)
Considered information in the video useful	9.26***	2.47	2.21
Reported learning something new from the video	34.42***	17.74***	3.29
Expressed willingness to recommend the video to a friend	14.12***	13.06***	12.36**
Planned on applying what they had learned from the video at home	17.08***	11.80**	9.49*
Considered watching the video in conjunction with the UNHS convenient	2.29	18.97***	3.81
Indicated that someone had spoken to them about the results of their infants' Hearing Screening	1.87	0.96	2.79
Understood what the results of the Hearing Screening meant for them and their infants	2.36	1.87	6.88
Recognized the importance of timely follow-up for infants who did not pass the UNHS	3.59 [†]	12.03**	3.16

Abbreviation: UNHS, universal newborn hearing screening.

[†]P < .10; *P < .05; **P < .01; ***P < .001.

^aResults without imputation are reported above. Given that 96% of individuals completely filled out the evaluation questionnaire, no multiple imputation was applied. Additional significant results from analysis of deviance revealed that low-SES participants were most likely to report learning something new and express willingness to recommend the video to a friend. Within the SIDS condition, however, high-SES participants were less likely than all other SES/language participants to recommend the video to a friend. Low-SES Spanish-speaking participants were most likely to plan to apply what they had learned from the video at home. Among TMW-Newborn participants, low-SES English-speaking participants were least likely to apply information from the videos at home.

willingness to recommend the intervention to others and planned to apply their learning with their newborns at home. Furthermore, implementing the TMW-Newborn intervention in conjunction with the UNHS was convenient for most mothers in this study.

The effectiveness of the TMW-Newborn intervention, in terms of knowledge gained and strategies learned, varied across SES/language. The intervention was most effective for high- and middle-SES English-speaking, moderately effective for the low-SES Spanish-speaking, but not significantly effective for the low-SES English-speaking mothers. This finding is in contrast to a prior formative research study, which did find that the TMW-Newborn intervention was associated with significant knowledge gain among low-SES English-speaking mothers.¹⁵ In contrast to the current study, formative testing included one-on-one instruction and guidance that may have enhanced learning of the low-SES mothers. Future iterations of the intervention video will present information in a direct and explicit manner, including an interactive question-and-answer component, so that the content is easy for parents of all SES to understand, remember, and apply with their infants. Parents will also receive written materials that reinforce the key messages of the intervention in order to enhance their learning and facilitate distribution of the information. Nevertheless, differences in the effectiveness of the current intervention might reflect heterogeneities in needs across the low-SES subsamples. Individuals with lower levels of starting knowledge such as low-SES English-speaking mothers might benefit from multiple educational curricula obtained at subsequent well-baby visits for their infants. Further studies will be needed to ensure the best strategies for this demographic group.

Implementing the TMW-Newborn intervention in conjunction with the UNHS provides essential information to mothers of newborns, who might otherwise never be exposed to this information. Despite the fact that all participants were given online access to the TMW-Newborn and SIDS videos at the end of the study, none of them watched either of the videos subsequent to their inpatient stay. Moreover, the intervention stressed early language exposure in promoting infant brain and language development, but did not explicitly discuss the frequency with which children do not follow up after a failed UNHS. About a quarter of the TMW-Newborn mothers did not generalize the emphasis on early language exposure to the importance of the UNHS follow-up; the lack of generalization was relatively high among low-SES mothers. Future iterations of the TMW-Newborn intervention will explicitly discuss the critical importance of rescreening in a timely manner in order to promote early diagnosis and intervention services, and to prevent speech and language delays.

Other limitations of the present study should be noted. The present study focused on changes in knowledge among mothers of newborns, without measuring changes in their home language environments and caregiving behaviors. In addition, implementation of the intervention was tested only at two university hospitals. Future research will examine whether the TMW-Newborn intervention will have a significant impact on home language environments and caregiving behaviors. To increase generalizability of the present findings, future research will examine the feasibility of implementing the TMW-Newborn intervention in conjunction with the UNHS on a large-scale, statewide level as well as the impact of the intervention on the UNHS lost to follow-up rate. Despite these limitations, the TMW-Newborn intervention is a cost-effective and easy-to-implement intervention that significantly addresses the limitations of the current postpartum education and provides parents with useful information and concrete strategies in prompting their newborns' early cognitive and language development.

Appendix

Item Statements and Scoring of the Baby SPEAK.

1.	Leaving the TV on in the background is a great way to give infants extra chances to learn words.	R
2.	When infants babble, they are practicing how to make words and have a conversation.	
3.	Responding to an infant every time he or she cries will only end up spoiling him or her.	R
4.	Typical infants can recognize their mother's voice as soon as they are born.	
5.	Infants learn very little about language in the first six months of their lives.	R
6.	Holding an infant close and making eye contact is a great way to build a positive connection.	
7.	Showing infants educational TV gives them a jump-start on learning how to talk.	R
8.	Basic care, such as feeding, changing, and bathing, is the only thing an infant really needs for healthy development.	R
9.	Using a firm and authoritative voice is the best way to teach an infant to calm down and stop crying.	R
10.	Having face to face "conversations" with infants is the best way to help build their brain.	
11.	Infants who get a lot of attention from their parents will grow up to be needy and dependent.	R
12.	Letting an infant "cry it out" helps the infant become more independent.	R

(continued)

Appendix (continued)

13.	Infants can learn more from watching educational TV than they can from being read to by their parents.	R
14.	Infants too young to talk might communicate by cooing or smiling.	
15.	Having the TV on in the background is a distraction for both infants and parents.	
16.	When an infant babbles, it's helpful for parents to respond as if the infant is saying real words.	
17.	Infants can understand some words even before they can speak.	
18.	Keeping regular feeding and sleeping routines is important for an infant's healthy development.	
19.	How smart an infant will become depends mostly on the "natural" intelligence he or she is born with.	R
20.	If an infant is upset or crying, it's best for parents to talk in a warm and calming tone of voice.	

Scoring Instructions: Scoring is based a criterion scale, with 0 point given to the most incorrect response and 1 additional point given to each progressively correct response. Items score from 0 (*strongly disagree*) to 4 (*strongly agree*), except items labeled with R are reverse-coded. Three numbers are calculated: (1) *sum score*—the sum of the participant's scores from all items answered; (2) *total possible score*—the maximum score possible from all items in the questionnaire; and (3) *possible score on items answered*—the maximum score possible from all items answered. Then, to adjust for the possibility of missing data in some items, the scale score was calculated using this equation: Scale Score = Sum Score × Total Possible Score/Possible Score on Items Answered.

Author Contributions

All authors confirm that the first and the senior authors contributed substantially to the concept and design of the present study. All authors also affirm that the second author wrote the first draft of the manuscript, and each author listed on the manuscript has revised and approved the manuscript as submitted and takes full responsibility for the manuscript.

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