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ORIGINAL RESEARCH

Determinants of Parental Interaction in Early Childhood: Insights from the 2022 Multiple Indicator Cluster Survey in Thailand

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Purpose: Parental interaction in learning-promoting activities is crucial for supporting early childhood development. This study aimed to assess the level of parental interaction among children aged 2–4 years in Thailand and to identify determinants associated with parental interaction.

Patients and Methods: A cross-sectional analysis was conducted using data from the 2022 Multiple Indicator Cluster Survey (MICS), which included a nationally representative sample of 7003 parents of children aged 2–4 years. Parental interaction was assessed through six activities promoting early stimulation and responsive care. Interaction levels were categorized as high (participation in four or more activities) or low (fewer than four activities). Multivariable logistic regression was employed to analyze associations between parental interaction levels and household and participant characteristics.

Results: The study found that 88.1% of parents reported high levels of interaction with their children. Children outside Bangkok had lower odds of high interaction, particularly in the Central (AOR=0.33), North (AOR=0.31), Northeast (AOR=0.44), and South (AOR=0.38) regions. Higher odds of high interaction were associated with maternal education above secondary level (AOR=2.00), the highest wealth quintile (AOR=2.48), living with either (AOR=2.14) or both parents (AOR=2.59), being in a non-Thai-speaking household (AOR=1.75), and having three or more books at home (AOR=3.63).

Conclusion: Nearly 12% of parents reported low levels of interaction with their children aged 2–4 years, with disparities associated with regional and socioeconomic factors. Policy efforts should prioritize integrating parental support into early childhood education programs and enhancing access to resources, such as children's books and community libraries, particularly for socioeconomically disadvantaged groups.

Keywords: preschool child, child development, parent-child relations, socioeconomic factors, caregivers

Introduction

Parental interaction during early childhood is increasingly recognized as a key factor in shaping child development outcomes.[1,2] Defined by UNICEF's, parental interaction refers to household members' engagement in six early stimulation and responsive care activities: reading books, telling stories, singing songs, taking the child outside, playing, and naming, counting, or drawing together.[3] These activities support children's development across cognitive, motor, language, socio-emotional, and self-regulation domains. As the first five years of life represent a period of rapid developmental change, this stage is considered a critical window for intervention.[4,5]

However, modern societal shifts—including increased digital exposure, economic stressors, and changes in family structure—have disrupted traditional caregiving practices, particularly in low- and middle-income settings.[6,7] These

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changes may reduce the quality and frequency of early stimulation and responsive caregiving—core components of nurturing care—potentially contributing to developmental inequities.[8] Understanding how parental interaction is evolving in response to these pressures is especially important in the context of the COVID-19 pandemic, which disrupted daily routines and intensified caregiver stress worldwide.[9]

Despite its central role in child development, recent evidence on how socioeconomic, cultural, and technological trends influence parental interaction remains limited. This gap is particularly urgent in rapidly transitioning settings, where vulnerable groups may be disproportionately affected by barriers such as low parental education, limited financial resources, or inadequate access to books and toys.[6–8] Identifying how these household and contextual factors shape parental interaction is critical to addressing inequities in early childhood development.

Thailand, an upper-middle-income country, exemplifies many of these transitions. Over the past decades, economic growth, urban migration, and changing family structures have altered caregiving norms.[10,11] The number of children under five has halved from six to three million in 60 years,[12] and the traditional role of grandparents in multigenerational households is increasingly disrupted, especially in rural areas.[13,14] These demographic and social shifts have amplified regional and socioeconomic disparities in caregiving support and child development outcomes.[15–18] In this evolving landscape, it is important to examine how regional location, household composition, and access to early learning materials influence levels of parental interaction.

Although earlier studies have examined parental interaction in Thailand using Multiple Indicator Cluster Survey (MICS) data from 2006 to 2019,[13,14,16,19,20] more recent evidence is lacking. Existing studies have tended to focus on child developmental outcomes rather than caregiver behaviors,[15,17] and few have considered newer determinants such as screen time, language spoken at home, or the lasting effects of the pandemic. This evidence gap is concerning given the rapidly changing nature of children's home environments. Without updated data, it becomes difficult to identify emerging risk factors, monitor inequities, or design relevant, responsive interventions to promote nurturing care.

This study addresses these gaps by analyzing data from the 2022 MICS to assess patterns of parental interaction among children under five during the COVID-19 period. It is the first national study in Thailand to use post-pandemic data and examine a broader range of determinants, including region, living arrangements, language, screen time, and access to books and play materials. The study aims to (1) describe the prevalence of parental interaction in Thailand using 2022 MICS data, and (2) examine its associations with household and contextual characteristics. In doing so, it offers timely insights to inform equity-focused policies and programs that support early childhood development in a changing Thai context.

Materials and Methods

Participants and Procedures

This study draws on data from the nationally representative 2022 Thailand Multiple Indicator Cluster Survey (MICS), conducted by the National Statistical Office (NSO) in collaboration with UNICEF. The MICS employed a stratified multistage cluster sampling technique to ensure representation across all five regions of Thailand, covering both urban and rural areas and a range of socioeconomic backgrounds.[3] In the first stage, enumeration areas (EAs) were selected using probability proportional to size within each stratum, defined by region and urban–rural classification. In the second stage, households within selected EAs were systematically sampled using updated household listings.

This two-stage sampling approach accounted for geographic diversity and population density, enhancing the precision of national and subnational estimates. Sampling weights were applied to adjust for unequal selection probabilities and non-response, ensuring generalizability of findings to the national population of children under five. For this analysis, we included children aged 24 to 59 months whose caregivers provided complete data on parental interaction and selected independent variables. Cases with missing responses were excluded.

Research Instruments

Data were collected using standardized household and child questionnaires developed by UNICEF under the MICS program and adapted for use in Thailand.[3,21] The Thai-language instruments included modules on household

characteristics, child care, living environment, and early learning activities, designed to capture indicators relevant to early childhood development.

Prior to the main fieldwork, a pilot test was conducted in February 2022 in Pathum Thani province to assess questionnaire clarity, cultural relevance, sequencing, and technical functionality of the Computer-Assisted Personal Interviewing (CAPI) system. Based on pilot findings, adjustments were made to improve interviewer training, field logistics, and questionnaire structure. This pretest process followed MICS protocols to ensure the instruments were well-suited to the national context.

Data Collection

Data were collected from June to October 2022 by 98 trained field teams from the NSO using CAPI-enabled tablets with CSPro software (Version 7.6).[3] In each selected household, if more than one child under five was present, one was randomly selected. The child's primary caregiver—typically the mother—was interviewed face-to-face using structured questionnaires. Interviews lasted approximately 60 minutes and covered child care practices, home environment, and child well-being. If the caregiver was unavailable or declined, up to three follow-up visits were made before categorizing the household as a non-responder.

Interviewers received standardized training on MICS protocols, CAPI-based data entry, and anthropometric measurements. Field supervisors conducted daily monitoring visits to ensure adherence to protocols and data quality. After collection, data were processed and managed using SPSS software. The anonymized dataset is publicly available through the NSO and MICS websites.

Data Management and Statistical Analysis

Parental Interaction

As defined by the MICS, parental interaction was assessed based on the involvement of household members, including mothers, fathers, and other caregivers, in six specific activities promoting early stimulation and responsive care.[3] These activities included: (1) reading books or looking at picture books, (2) telling stories, (3) singing songs, (4) taking the child outside (eg, to a compound or yard), (5) playing with the child, and (6) naming, counting, or drawing things together. These activities are globally recognized for their role in fostering cognitive, socio-emotional, and motor development during early childhood.

To measure the level of parental interaction, we categorized it as "high" or "low" based on participation in these activities. "High parental interaction" was defined as participation in at least four out of the six activities, while "low parental interaction" referred to participation in fewer than four. This threshold was selected based on established international guidelines for early childhood care and prior MICS studies in Thailand, ensuring comparability across contexts.[3,16,21,22]

Independent Variables

Independent variables were selected based on prior MICS studies and relevant literature on factors influencing parental interaction in Thailand and other LMICs.[13–17,19,20] These variables included child's age, sex, region, residency type (urban/rural), maternal education, household wealth, living arrangements, language spoken at home, number of books in the household, availability of playthings, and screen time. These variables were selected to capture known influences on parenting behavior and early stimulation, including demographic characteristics (eg, child age and sex), socioeconomic status (eg, maternal education, wealth), household structure (eg, living arrangements), and environmental and cultural context (eg, region, language, access to materials).[1,2,13–17,19,20,23,24]

Regions were categorized into five groups: Bangkok, Central, North, Northeast, and South. Residency type was classified as urban (within municipality areas) or rural (outside municipality areas). Maternal education was grouped into three levels: below-secondary, secondary, and above-secondary. Household wealth was divided into quintiles, ranging from the lowest (quintile 1) to the highest (quintile 5). Living arrangements were categorized as living with neither parent, either parent, or both parents. The primary language spoken at home was classified as Thai or non-Thai. Parents reported the number of children's books available at home (fewer than three or three or more) and whether the child had

access to playthings. Screen time was categorized according to World Health Organization guidelines as less than one hour or one hour or more per day.[25]

Statistical Analysis

The analysis followed MICS guidelines.[3,26] Descriptive statistics were used to calculate the frequency and percentage of participants by parental interaction level. Bivariate associations between parental interaction and independent variables were tested using chi-square analyses, with statistical significance set at $p < 0.05$. Multivariable logistic regression was then used to examine associations between the independent variables and high parental interaction. Survey weights were applied to account for the complex sampling design and ensure national representativeness. Results are presented as adjusted odds ratios (AOR), 95% confidence intervals (CI), and p-values. All analyses were conducted using Stata Statistical Software version 17 (StataCorp LP, College Station, TX, USA).

Ethics Approval and Consent

The MICS was conducted by the NSO of Thailand under the Statistics Act, B.E. 2550 (2007), which mandates the collection of population data without requiring additional ethical review.[27] As part of the survey procedures, verbal informed consent was obtained from all participants by NSO-trained interviewers before data collection. Participants were informed about the voluntary nature of participation, data confidentiality, and their right to withdraw at any time.[3,21,27] Consent was documented by the NSO as per their standard procedures.

This study is a secondary analysis of anonymized MICS data. The NSO granted the research team full access to the microdata. Ethical approval for the analysis was granted by the Thailand Department of Health Institutional Review Board (approval number 757/2024).

Results

Participants' Characteristics

Of the 7,212 children aged 24–59 months surveyed in the 2022 Thailand MICS, 7,003 with complete data on parental interaction and sociodemographic characteristics were included in the analysis (Figure 1). The age was evenly distributed across 2-, 3-, and 4-year-olds, and the sample was nearly evenly split by sex (51.6% boys, 48.4% girls). Most children lived in the South (33.4%) or Northeast (31.2%), with fewer in the North (18.3%), Central (11.5%), and Bangkok (5.6%). A larger proportion resided in rural areas (60.1%) compared to urban areas (39.9%).

In terms of household characteristics, 32.0% of mothers had below-secondary education, 41.2% had secondary, and 26.8% had education above secondary. Household wealth was distributed across quintiles, with 22.3% in the lowest and 16.1% in the

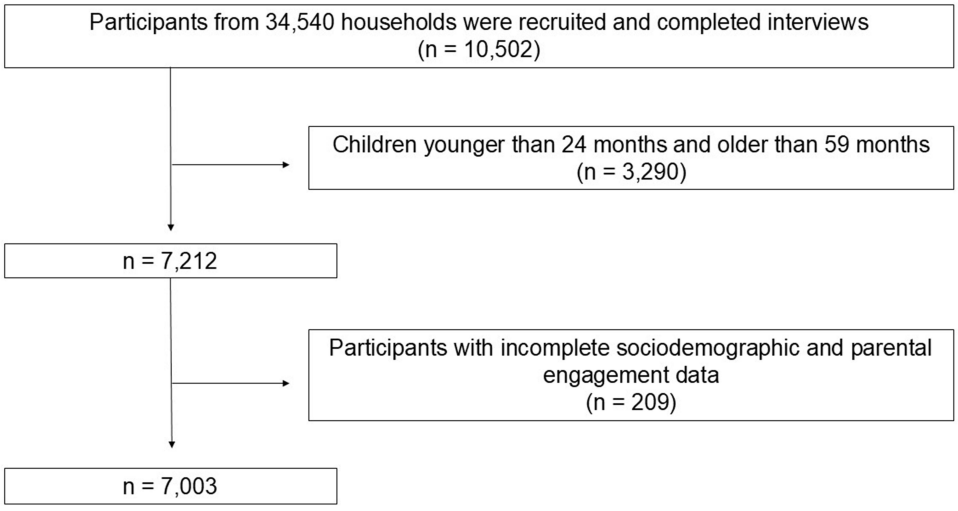

Figure 1 Participants flow chart.

highest. More than half of the children (55.6%) lived with both parents, while 21.8% lived with one parent and 22.6% with neither. Thai was the primary language in 90.1% of households. Regarding home learning environments, 45.4% had access to three or more books, 93.3% had access to playthings, and 58.2% had screen time of one hour or more per day.

Parental Interaction Levels by Participant Characteristics

Overall, 88.1% of caregivers reported high parental interaction (Table 1). Higher levels were observed in Bangkok (95.1%) and urban areas (92.1%) compared to rural areas (85.4%). Parental interaction was also positively associated

Table 1 Participant Characteristics and Household Environments by Parental Interaction

Participants' Characteristics	**Total n = 7,003 (100%)**		**High Parental Interaction n = 6,169 (88.1%)**		***p*-value[a]**
	n	**% (Column)**	**n**	**% (Row)**	
Age (years)					0.44
2	2,284	32.6	2,043	89.4	
3	2,351	33.6	2,037	86.6	
4	2,366	33.8	2,088	88.3	
Sex					0.11
Male	3,612	51.6	3,162	87.5	
Female	3,391	48.4	3,043	89.7	
Region					<0.001
Bangkok	391	5.6	372	95.1	
Central	804	11.5	717	89.2	
North	1,285	18.3	1,122	87.3	
Northeast	2,186	31.2	1,871	85.6	
South	2,337	33.4	2,123	90.8	
Residency					<0.001
Urban	2,797	39.9	2,576	92.1	
Rural	4,206	60.1	3,594	85.4	
Maternal education					<0.001
Below secondary education	2,240	32.0	1,802	80.4	
Secondary education	2,888	41.2	2,554	88.4	
Above secondary education	1,876	26.8	1,814	96.7	
Household wealth (quintile)					<0.001
1	1,564	22.3	1,229	78.6	
2	1,427	20.4	1,213	85.0	
3	1,401	20.0	1,247	89.0	
4	1,481	21.2	1,393	94.0	
5	1,129	16.1	1,088	96.3	

(*Continued*)

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Table 1 (Continued).

Participants' Characteristics	Total n = 7,003 (100%)		High Parental Interaction n = 6,169 (88.1%)		*p*-value[a]
	n	% (Column)	n	% (Row)	
Living arrangements					<0.001
Living with neither mother nor father	1,586	22.6	1,215	76.6	
Living with either mother or father	1,524	21.8	1,363	89.5	
Living with both mother and father	3,893	55.6	3,591	92.2	
Language used at home					0.55
Thai	6,313	90.1	5,553	88.0	
Non-Thai	690	9.9	616	89.3	
Number of books at home					<0.001
<3	3,824	54.6	3,129	81.8	
≥3	3,179	45.4	3,040	95.6	
Availability of playthings					0.35
No	470	6.7	405	86.1	
Yes	6,533	93.3	5,765	88.2	
Screen time duration (hour/day)					0.12
0	2,930	41.8	2,590	88.4	
≥1	4,073	58.2	3,579	87.9	

Notes: [a]Bivariate association between categorical variables and parental interaction were examined via chi-square analyses (p-value <0.05 = statistical significance).

with maternal education and household wealth. Among mothers with education above secondary level, 96.7% reported high interaction, while only 80.4% of those with below-secondary education did. Similarly, the wealthiest households had the highest interaction rate (96.3%) compared to the lowest wealth group (78.6%).

Children living with both parents were more likely to experience high interaction (92.2%) than those living with either one (89.5%) or neither parent (76.6%). Households with three or more children's books showed significantly greater interaction (95.6%) compared to those with fewer than three books (81.8%). In contrast, child's sex, age, primary language spoken at home, availability of playthings, and screen time duration were not significantly associated with interaction levels in bivariate analyses.

Multivariable Analysis of Factors Associated with High Parental Interaction

Multivariable logistic regression analysis revealed several significant predictors of high parental interaction after adjusting for covariates (Table 2). Children living outside Bangkok had significantly lower odds of high parental interaction, with the strongest disparities observed in the North (AOR = 0.31, 95% CI: 0.15–0.64) and Central (AOR = 0.33, 95% CI: 0.16–0.66) regions. Higher maternal education was also positively associated; children whose mothers had education above the secondary level were twice as likely to receive high interaction compared to those whose mothers had less than secondary education (AOR = 2.00, 95% CI: 1.14–3.52). Household wealth showed a clear gradient, with children in the highest wealth quintile having significantly greater odds of high interaction (AOR = 2.48, 95% CI: 1.40–4.39) compared to those in the lowest. Living with one or both parents also increased the likelihood of high interaction (AOR = 2.14, 95% CI: 1.30–3.54, AOR = 2.59, 95% CI: 1.77–3.78, respectively), as did living in a non-Thai-

Table 2 Multivariable Logistic Regression Analyses of Participants' Profiles and Parental Interaction

Participants' Characteristics	High Parental Interaction			
	Adjusted Odds Ratio	95% Confidence Interval		*p*-value
		Lower	Upper	
Age (years)				
Ref = 2				
3	0.75	0.49	1.14	0.17
4	0.85	0.59	1.23	0.40
Sex				
Ref = Male				
Female	0.98	0.72	1.35	0.92
Region				
Ref = Bangkok				
Central	0.33	0.16	0.66	0.002
North	0.31	0.15	0.64	0.001
Northeast	0.44	0.22	0.88	0.02
South	0.38	0.17	0.85	0.02
Residency				
Ref = Urban				
Rural	0.73	0.50	1.08	0.12
Maternal education				
Ref = Below secondary education				
Secondary education	0.96	0.64	1.42	0.83
Above secondary education	2.00	1.14	3.52	0.02
Household wealth (quintile)				
Ref = 1				
2	1.39	0.92	2.10	0.11
3	1.65	1.01	2.71	0.04
4	2.42	1.38	4.21	0.002
5	2.48	1.40	4.39	0.002
Living arrangements				
Ref = Living with neither mother nor father				
Living with either mother or father	2.14	1.30	3.54	0.003
Living with both mother and father	2.59	1.77	3.78	<0.001

(*Continued*)

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Table 2 (Continued).

Participants' Characteristics	High Parental Interaction			
	Adjusted Odds Ratio	95% Confidence Interval		*p*-value
		Lower	Upper	
Language used at home				
Ref = Thai				
Non-Thai	1.75	1.05	2.93	0.03
Number of books at home				
Ref = <3				
≥3	3.63	2.41	5.45	<0.001
Availability of playthings				
Ref = No				
Yes	1.51	0.99	2.31	0.06
Screen time duration (hour/day)				
Ref = 0				
≥1	0.82	0.60	1.13	0.22

Notes: Model adjusted for age, sex, residency (region, urbanicity), maternal education, household wealth, living arrangements, language used at home, number of books at home, availability of playthings, and screen time duration.

speaking household (AOR = 1.75, 95% CI: 1.05–2.93). One of the strongest predictors was having three or more books at home (AOR = 3.63, 95% CI: 2.41–5.45).

Discussion

This study examined the determinants of high parental interaction among Thai children aged 2–4 years using nationally representative data collected during the COVID-19 pandemic. While a large majority (88.1%) of caregivers reported engaging in four or more stimulation activities with their child, meaningful disparities were evident across regions, household wealth, maternal education, living arrangements, home language, and access to books.

The slightly lower rate of high parental interaction in 2022 compared to previous MICS rounds[13,16,20] may reflect growing economic pressures, evolving family structures, and the impacts of the COVID-19 pandemic, which disrupted household routines and increased caregiver stress.[9,28,29] As data were collected during the pandemic, these findings underscore the importance of continued monitoring to understand its lasting effects on caregiving.

Theoretical Implications

This study highlights how structural and contextual disadvantages—such as lower maternal education, household poverty, non-parental living arrangements, and limited access to books—constrain opportunities for responsive caregiving. Regional disparities, with lower interaction levels outside Bangkok, further emphasize the role of social determinants in shaping caregiving environments. These findings align with the Nurturing Care Framework's emphasis on responsive caregiving and early learning and point to the need for more inclusive models of nurturing care.[1,2,23,24] Notably, higher interaction levels among non-Thai-speaking households suggest the presence of cultural resilience, underscoring the importance of recognizing diverse caregiving strengths within different household contexts.

Practical Implications

This study highlights regional, socioeconomic, and household-level disparities in parental interaction, with actionable implications for promoting equitable early childhood development in Thailand. Children in Bangkok were significantly more likely to receive high parental interaction than those in other regions, reflecting uneven access to resources such as books and early learning opportunities.[10,11] Given the relatively high coverage of early childhood education programs outside Bangkok, integrating parenting support—such as caregiver training and home learning guidance—into these existing platforms could help address these gaps.

Maternal education and household wealth emerged as strong predictors of high parental interaction. Caregivers with higher education were more likely to engage in enriching activities such as reading and structured play, while wealthier families had greater access to learning materials and more flexibility to spend time with their children.[6,7,30–32] These findings underscore the need to embed parenting education in maternal and child health services—particularly antenatal care and well-child visits—to strengthen caregiving knowledge and skills among less-advantaged caregivers.

Children living with both parents were more likely to benefit from shared caregiving and greater exposure to developmental activities such as reading and play.[7,33,34] In contrast, those living with neither parent often relied on extended family members or other caregivers who may face challenges in providing consistent, developmentally supportive care. These caregiving arrangements, common in areas affected by parental migration to Bangkok,[10,11] highlight the need for targeted support within early childhood education programs. Tailored guidance and resources for non-parental caregivers, particularly grandparents, could help ensure more equitable nurturing care across household types.

The presence of books was one of the strongest predictors of parental interaction, with children in homes with three or more books being more than three times as likely to receive high interaction. Expanding access to children's books—through public subsidies, mobile libraries, or school-based distribution—offers a scalable strategy for increasing stimulation at home.[34,35] Meanwhile, the unexpectedly high interaction rates among non-Thai-speaking households suggest cultural strengths that should be preserved while addressing potential language and access barriers through inclusive, culturally sensitive programming.[36]

Together, these findings support multi-pronged policy efforts: integrating parenting support into Early Childhood Education programs, targeting resource provision to low-income families, supporting non-parental caregivers, and ensuring access to early learning materials. Aligning such efforts with Thailand's existing child support grant and community health infrastructure can enhance their reach and sustainability.

Strengths, Limitations and Future Research

A key strength of this study is its use of recent, nationally representative data, offering timely insights into parental interaction patterns during the COVID-19 pandemic. The large sample size and inclusion of diverse geographic and socioeconomic groups enhance the generalizability of the findings across Thailand.

However, several limitations should be noted. First, the reliance on self-reported data may introduce recall or social desirability bias, particularly regarding parenting behaviors that are socially valued. Second, the cross-sectional design limits causal interpretation, restricting conclusions about whether parental interaction directly influences child development outcomes. Third, the sampling frame—based on household registries—may have excluded unregistered or marginalized populations, such as undocumented migrants or homeless families, whose caregiving contexts may differ substantially. Finally, while this study followed the MICS-recommended threshold for defining high parental interaction, we were unable to conduct sensitivity analyses using alternative cutoffs due to analytic constraints.

Future research should explore longitudinal designs to better understand how parental interaction influences developmental outcomes over time. Qualitative studies could provide deeper insights into caregiving dynamics among extended families and culturally diverse households. In addition, evaluations of parenting interventions—especially those targeting caregivers in rural areas or non-parental arrangements—would contribute valuable evidence to guide more inclusive and effective policy and program development.

Conclusion

Parental interaction remains a critical aspect of early childhood development, yet disparities persist across household, regional, and structural lines in Thailand. Children from less-educated families, lower-income households, non-parental living arrangements, and outside Bangkok were less likely to receive high parental interaction. These findings emphasize the importance of integrating parenting support into early childhood systems, expanding access to learning resources, and designing inclusive, culturally responsive policies. Strengthening these areas can help ensure more equitable developmental opportunities for all young children in Thailand.

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Disclosure

The authors report no conflicts of interest in this work.

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