

# Preschool-Aged Children's Television Viewing in Child Care Settings

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## KEY WORDS

television, preschool, infants, day care

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**WHAT'S KNOWN ON THIS SUBJECT:** Most previous estimates of preschool-aged children's screen time were based on parental reports of home viewing. Estimates of screen time in day care settings are lacking.



**WHAT THIS STUDY ADDS:** Children experience considerable additional television viewing in day care settings. For many children, this may double their total amount of screen time.

## abstract

**OBJECTIVE:** The goal was to quantify television viewing in day care settings and to investigate the characteristics of programs that predict viewing.

**METHODS:** A telephone survey of licensed child care programs in Michigan, Washington, Florida, and Massachusetts was performed. The frequency and quantity of television viewing for infants, toddlers, and preschool-aged children were assessed.

**RESULTS:** With the exception of infants, children in home-based child care programs were exposed to significantly more television on an average day than were children in center-based programs (infants: 0.2 vs 0 hours; toddlers: 1.6 vs 0.1 hours; preschool-aged children: 2.4 vs 0.4 hours). In a regression analysis of daily television time for preschool-aged children in child care, center-based programs were found to have an average of 1.84 fewer hours of television each day, controlling for the other covariates. Significant effect modification was found, in that the impact of home-based versus center-based child care programs differed somewhat depending on educational levels for staff members; having a 2- or 4-year college degree was associated with 1.41 fewer hours of television per day in home-based programs, but no impact of staff education on television use was observed in center-based programs.

**CONCLUSIONS:** For many children, previous estimates of screen time significantly underestimated actual amounts. Pediatricians should counsel parents to minimize screen time in child care settings. *Pediatrics* 2009;124:1627–1632

The American Academy of Pediatrics discourages television viewing in the first 2 years of life and recommends a daily limit of 1 to 2 hours of quality programming for older children.<sup>1</sup> Several previous studies documented that US preschool-aged children watch 1 to 3 hours of television per day.<sup>2–6</sup> Although quality educational programming does exist for 3- to 5-year-old children,<sup>7–9</sup> television viewing before the age of 3 was associated with cognitive delays, attentional problems, and sleep disorders in observational studies.<sup>10–13</sup> All previous, population-based estimates of children's screen time relied on parental reports of viewing in the home. Given that the majority of preschool-aged children are cared for by someone other than a parent, such reports may underestimate significantly the true amount of young children's screen time. In a previous study, we used data from a 1989 survey to estimate television viewing in child care programs.<sup>14</sup> The past 10 years have seen a significant increase in video products designed for very young children, and these now 20-year-old data are in need of updating.<sup>15</sup> Therefore, we conducted a study with 2 objectives, that is, to describe the frequency and amount of television viewing (including DVD and videotape viewing) in a representative group of licensed child care settings and to determine predictors of television viewing in these settings.

## METHODS

### Data Source

We surveyed home- and center-based child care programs from 4 states in different regions of the United States, in an effort to obtain a more-generalizable sample. The following states were selected: Florida, Massachusetts, Michigan, and Washington. For each state, a complete listing of licensed home- and center-based child care programs was obtained from the

state agency in charge of child care licensing. A random sample, stratified according to both state and program type, was selected, and letters were mailed to selected child care programs, informing them that a staff member would be calling with a research survey. Research staff members made multiple attempts to reach each program, arranging for convenient times to call back to speak with the director or owner of the program when necessary. Informed consent was obtained, and participants were screened for eligibility; child care programs that did not provide full-time care to children <5 years of age were not eligible for inclusion. The Seattle Children's Hospital institutional review board approved the research protocol.

### Outcome Measures

Our primary outcome measures were whether television was used in the child care program and the hours of television reported as usually watched by children in different age groups at the program. Participants were asked, "Do you ever use a TV, videos, or DVDs in any of your classrooms?" Those who responded "yes" were asked for which age groups (infants, toddlers, preschool-aged children, or school-aged children in after-school care) television was used and approximately how many hours each week it was used for each age group.

### Covariates

We collected data regarding characteristics of the child care program, including hours open daily, number of staff members (in full-time equivalents), number of children, whether after-school care was provided on the premises for school-aged children, and the educational attainment of child care providers. As much as possible, the survey questions for these issues were based on those in the 1989 survey, to enable us to repli-

cate the analysis. For home-based programs, the survey asked about the highest educational level achieved by the owner of the program; for center-based programs, we asked about the "highest educational level that most of the lead teachers had completed." The difference in these questions was necessitated by the fact that we were asking about primary child care providers in a number of classrooms within each center, compared with a single primary child care provider in home-based settings.

### Statistical Methods

We used bivariate statistical analyses to compare descriptive characteristics of the home- and center-based program participants. Comparisons were made by using  $\chi^2$  tests for dichotomous and categorical variables and *t* tests for continuous variables. Multivariate linear regression analyses examined predictors of daily hours of television viewing among preschool-aged children. The first regression analysis examined program type (home- or center-based), daily hours open, after-school care, and staff education (dichotomized as 2- or 4-year degree versus high school diploma or some college). The second regression analysis examined whether there was an effect modification between program type and staff education, controlling for the same covariates. This analysis was motivated by our previous study in which educational levels for staff members interacted significantly with viewing time.<sup>14</sup> On the basis of our previous study, we estimated that we would need to enroll 100 programs of each type to have 80% power to achieve statistical significance for differences in viewing times.

## RESULTS

We contacted owners or directors at 326 child care programs; 209 (64%) agreed to participate and, of those, 168 met eligibility criteria and completed

**TABLE 1** Descriptive Characteristics of Participating Programs

	Home-Based	Center-Based	<i>P</i>
<i>N</i>	94	74	
Provides care for, %			
Infants	60	40	
Toddlers	81	61	
Preschool-aged children	84	74	
School-aged children	41	42	
Total no. of children, mean ± SD	7.9 ± 4.3	83.4 ± 58.6	<.001
Time open, mean ± SD, h/d	11.3 ± 3.1	11.0 ± 1.3	
Provides after-school care, %	44	57	.09
Educational attainment, % <sup>a</sup>			<.01
High school diploma	28	7	
Some college	21	23	
2-y college degree	23	31	
4-y college degree	28	39	
Any television use for, %			
Infants	12	0	.03
Toddlers	51	8	<.001
Preschool-aged children	70	32	<.001
School-aged children	49	31	

All *P* values of <.10 are reported.

<sup>a</sup> Of the owner for home-based programs and of the majority of lead teachers for center-based programs.

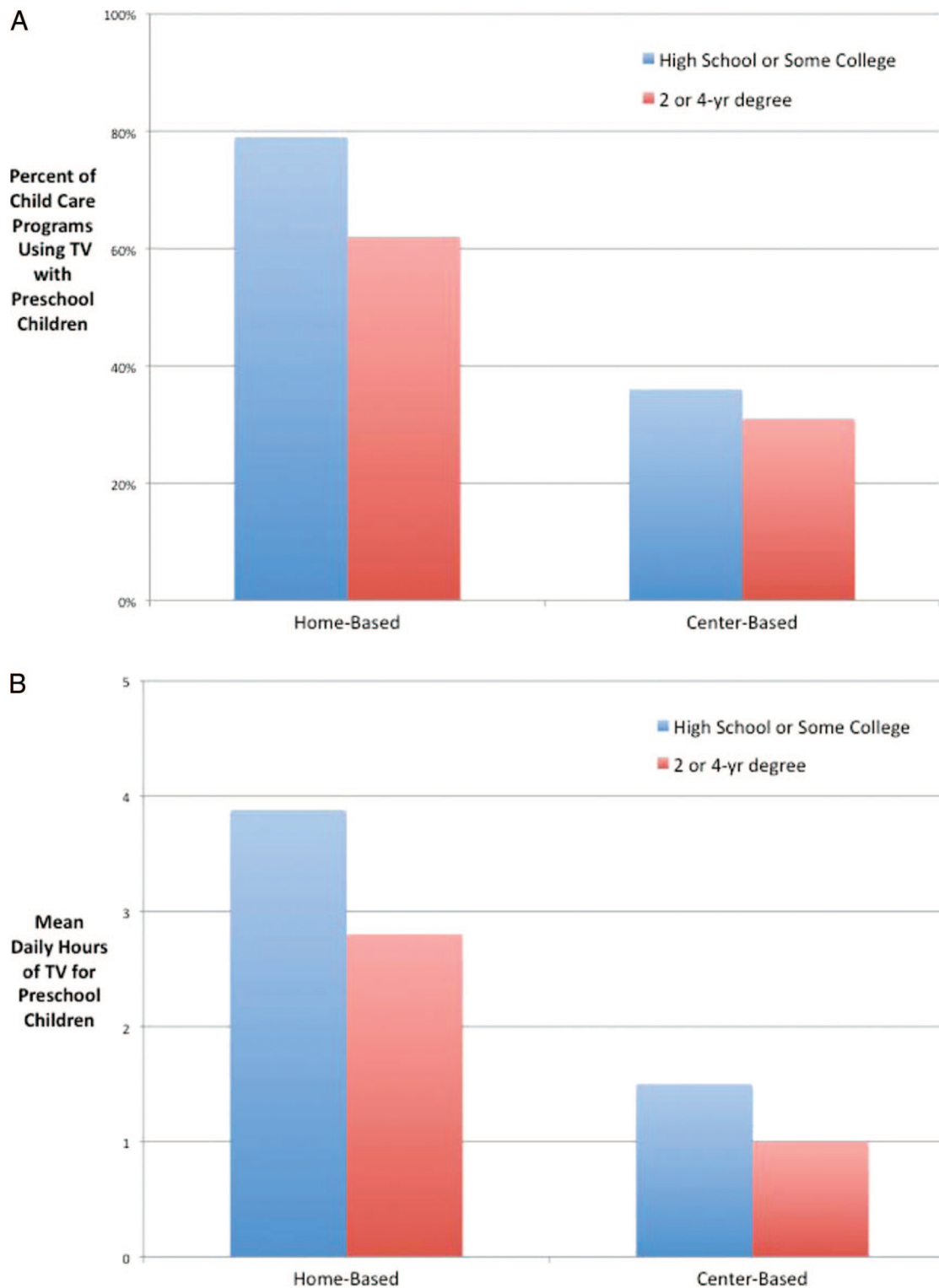
**TABLE 2** Comparison of Television Viewing According to Child Care Program Type

	Home-Based ( <i>N</i> = 94)	Center-Based ( <i>N</i> = 74)	<i>P</i>
Television time, mean ± SD, h/d			
Infants	0.2 ± 1.3	0	NS
Toddlers	1.6 ± 2.4	0.1 ± 0.7	<.001
Preschool-aged children	2.4 ± 1.8	0.4 ± 0.9	<.001
School-aged children	1.6 ± 2.5	0.4 ± 1.0	<.01
Television time in centers where television is used at all, mean ± SD, h/d			
Infants	2.3 ± 3.8	NA	
Toddlers	3.2 ± 2.6	1.3 ± 1.7	.08
Preschool-aged children	3.4 ± 2.8	1.2 ± 1.3	<.001
School-aged children	3.2 ± 2.7	1.5 ± 1.4	.07
Daily television use, %			
Infants			.08
None	88	100	
≤1 h	10	0	
2–4 h	0	0	
5–10 h	2	0	
Toddlers			<.001
None	49	89	
≤1 h	21	10	
2–4 h	12	0	
5–10 h	17	2	
Preschool-aged children			<.001
None	30	64	
≤1 h	27	32	
2–4 h	18	1	
5–10 h	25	3	
School-aged children			.06
None	51	69	
≤1 h	20	24	
2–4 h	12	5	
5–10 h	17	2	

All *P* values of <.10 are reported. NA indicates not applicable; NS, not significant.

the survey. There were no differences in response rates according to state or program type. Of those, 94 were home-based programs and 74 were center-based. The most common reason for not meeting eligibility criteria was not providing care for preschool-aged children (eg, after-school care—only child care settings). The characteristics of the surveyed programs are presented in Table 1. Among home-based programs, 51% of owners reported having a 2- or 4-year college degree; in center-based programs, 70% of participants responded that most lead teachers had at least a 2- or 4-year college degree.

Television viewing was examined for infants, toddlers, preschool-aged children, and school-aged children. For each of the 3 younger age groups, children in home-based child care programs were exposed to significantly more television on an average day than were children in center-based programs (Table 2). For example, 70% of home-based program owners reported using television with preschool-aged children, compared with 36% of center-based programs (Fig 1). Among the respondents who reported using television with preschool-aged children, >90% reported that they used it either for educational reasons or for both educational and entertainment reasons. The mean time of daily television use for preschool-aged children in day care settings in which television was used at all was 3.4 hours in home-based programs, compared with 1.2 hours in center-based programs ( $P < .001$ ). When programs that reported no television use were included, the difference increased to 2.4 hours versus 0.4 hours, a sixfold difference ( $P < .001$ ). In the regression analysis of daily television time for preschool-aged children in child care, center-based programs were found to have an average of 1.84 fewer hours of tele-



**FIGURE 1** Television viewing according to program type and staff educational level. A, Television viewing according to program type and educational level of staff members. B, Mean hours of television viewing according to program type and educational level of staff members for programs that reported any viewing.

vision each day, controlling for the other covariates. Significant effect modification was found, in that the im-

pact of home-based versus center-based child care programs differed somewhat according to the educa-

tional levels for staff members. Compared with home-based programs in which the director had not attended

college, children in home-based programs in which the director had a 2- or 4-year college degree watched fewer hours of television per day (−1.41 hours [95% confidence interval: −2.32 to 0.50 hours]), as did those in center-based programs in which the preponderance of teachers had a high school diploma or some college (−2.69 hours [95% confidence interval: −3.78 to −1.59 hours]) or a 2- or 4-year degree (−2.70 hours [95% confidence interval: −3.57 to −1.83 hours]).

## DISCUSSION

We found that children in as many as 70% of home-based child care settings and 36% of center-based child care settings watch television daily. More importantly, when television is viewed at all, infants and children spend 2 to 3 hours watching in home-based programs and ~1.5 hours watching in center-based programs. To our knowledge, these are the first data on day care television viewing in 20 years, and they suggest that estimates of preschool-aged child screen time may underestimate actual screen time by >100%.<sup>6</sup> The current reported usage is consistent with findings from a previous study,<sup>14</sup> in terms of both the number of hours and the proportion of programs that use television at all. This lack of change is disconcerting, given the intervening publication of the American Academy of Pediatrics guidelines regarding television use for young children.<sup>1,14,16</sup>

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Previous studies gave us ample reason to be concerned about this amount of screen time. First, infant and toddler television exposure was associated with obesity,<sup>1,17–20</sup> language delay,<sup>13</sup> inactivity,<sup>21</sup> aggression,<sup>22–25</sup> and decreased attention spans.<sup>10,26–28</sup> Second, longitudinal studies found that preschool viewing predicted viewing in later childhood.<sup>29,30</sup> Third, preschool environments represent important socialization and educational venues for children. Opportunities for interactions with peers and teachers, as well as outdoor play time, all of which are components of high-quality child care, are displaced by passive television viewing at the levels reported.<sup>31</sup>

Consistent with findings from other studies, the rationale for the use of television in day care settings seems to be that television is viewed as an educational activity.<sup>5,32</sup> However, at the levels of viewing reported here, even educational television has limitations. Previous studies of the benefits of high-quality television evaluated exposures of <1 hour.<sup>7,9</sup> Furthermore, even background television, defined as television that is on but not being actively viewed, was shown to interrupt children's play.<sup>33</sup>

There are some limitations to our analysis, which warrant consideration. First, our screen time estimates are based on self-reports. Although self-reports have been shown to be correlated with actual viewing in home environments,<sup>34</sup> the validity for child care environments has not been assessed.

However, given that respondents presumably schedule their children's days, they are likely to be aware of the amount of time the television is on. Furthermore, social desirability bias would favor underreporting in this setting. Second, we selected child care programs from 4 states in the country, with regional variability. To what extent these findings can be generalized to other states is not known, but our results are consistent with a previous national estimate.<sup>14</sup> Third, we have little information on the content viewed. This is immaterial in the case of infant viewing, because there are no educational programs for that age group.<sup>15</sup> Although there is high-quality programming for older children (3–5 years of age) that can promote reading skills and prosocial behavior, the benefits of those programs have never been evaluated against an alternative of formal education and socialization by teachers.<sup>7,9,35–38</sup>

Despite these limitations, our findings highlight just how pervasive screen time is for very young US children. As efforts to promote high-quality preschool for all children are advanced, attention to screen time is warranted. The American Academy of Pediatrics statement in 1999 urged that television use be minimized for young infants and children<sup>16</sup>; our data suggest that clinicians must encourage parents to engage their children's caregivers about screen time outside the home as well.

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