



EARLY INITIATION OF TELEVISION VIEWING: DOES IT MAKE A DIFFERENCE IN DEVELOPMENTAL FUNCTIONING?

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ABSTRACT

OBJECTIVE: To examine the impact of television (TV) exposure and the home environment on developmental functioning in young children.

METHODOLOGY: A total of 230 school-going children (5-9 yrs) studying in a private school in a north Indian city were recruited. A semi-structured questionnaire was used to assess the number of screens that children had access to, content viewed on TV, daily TV consumption, co-viewing habits, parents' perceptions about the negative and positive effects of TV use. The Mohite home environment inventory assessed the quality of the home environment. The main outcome measure was the child's overall developmental functioning which was measured by the Developmental Profile 3 (DP 3).

RESULTS: The majority (77%) of the children watched TV for 1-2 h/day and the prevalence of TV \geq 2 h/day was 20%. A little more than one-fifth of the parents (21.9%) reported that their child had regularly started to view the TV screen by age 2. Significant differences were found between the early initiation of TV (\leq 24months) group of children and the later initiated group ($>$ 24months) on the DP 3 sub-domains and the general developmental quotient (GDQ) ($t=2.64$, $P=.009$). Multivariate regression analysis indicated that the number of children in the family, socio-economic status, age at initiation of TV viewing, and home environment explained 14.3% of the variance in the GDQ score ($F=10.46$, $P=.0001$).

CONCLUSIONS: Early initiation of digital media is associated with poorer developmental outcomes. Pediatricians have a critical role in providing anticipatory guidance to parents regarding inculcating healthy digital screen viewing habits.

KEYWORDS : early initiation of TV viewing; home environment; developmental functioning

INTRODUCTION:

In recent years there has been a proliferation of digital screen devices in homes and as a result, the lives of children are becoming increasingly digitalized, more so post COVID-19. Television (TV) has emerged as one of the most established leisure-time activities for children and concerns regarding its relationship with developmental functioning have been raised [1]. Since the exposure to TV and other digital screens, mobiles, and computer has become ubiquitous, concerns regarding how screen-based media use are going to affect how children learn, play, and form relationships have been raised. Previous studies conducted in India and other countries have shown that the exposure to television in young children is highly prevalent and also increasing over time, although its implications for child development are still unexplored [2-3]. Children's exposure to screen-based media, especially for entertainment, has been associated with a myriad of negative outcomes including poor executive functioning, language skills, cognition, inattention, behavioral difficulties, decreased physical activity and sleep [4-7]. A recently published meta-analysis (42 studies, $N=18905$) found that greater duration of screen use and background television were significantly correlated with lower language skills. On the other hand, better-quality screen time use such as viewing educational programs and co-viewing with parents were related to better child language skills [7]. In view of the cognitive-behavioral risks associated with excessive engagement with TV screen, many academic pediatric associations have recommended that parents should limit screen-based media use to no more than two hours for children aged 2 years and above [8-9]. On the other hand, several developmental psychologists have argued that the amount of television exposure and the nature of the content viewed are both important in determining outcomes [10-12].

A rarely explored risk factor for time spent viewing TV is the quality of the home environment and alternate sources of stimulation which parents provide their children such as learning materials (books, art, and toys), social and educational outings, and nurturing care. There is abundant evidence that children from enriched and stimulating home environments have better developmental outcomes [13-14]. Excessive TV viewing may likely be a proxy measure for a reduced amount of direct parental-engagement with children and the negative impact on development may be mediated through the quality of the home environment. Given this, the present study examined the impact of the home environment and TV exposure in influencing developmental functioning in young children.

METHODOLOGY

Participants: A total of 230 school-going children (5-9 yrs) studying in a private school in a north Indian city were recruited. The sample was a convenient one. The study was approved by the ethics review board and informed written consent was taken from the parents. Participation in the study was voluntary. A semi-structured questionnaire was used to assess the number of screens that children had access to, content viewed on TV, favorite TV shows, daily TV consumption, co-viewing habits, parents' perceptions about the negative and positive effects of TV use, and behavioral impact of TV. All information was obtained through the caregiver report.

The Mohite home environment inventory assessed the quality of the home environment by observation of the child and parental interactions [15]. The inventory has five sub-scales including language stimulation, physical environment,

encouragement of social maturity, variety of stimulation, maternal attitude and discipline. The presence of each behavior was scored and higher scores indicated a more stimulating home environment. The main outcome measure was the child's developmental functioning which was measured by the Developmental Profile 3 (DP 3) [16]. The DP 3 assesses developmental functioning in five developmental domains including physical, adaptive, social-emotional, cognitive, and communication domains. The DP 3 is an interview-based assessment battery that provides standard scores with a mean of 100 and a standard deviation of 15. The battery also provided an overall general developmental quotient (GDQ) that was used as the primary outcome measure.

Table 1: Age of initiation of TV and developmental functioning

Developmental Quotients	≤24months n=48 Mean (SD)	>24months n=182 Mean (SD)	t ratio	P Value
Physical DQ	100.96 (11.93)	104.63 (10.78)	2.05	.042
Adaptive DQ	85.27 (10.02)	89.86 (13.70)	2.17	.031
Social emotional DQ	103.36 (11.83)	108.30 (14.05)	2.22	.028
Cognitive DQ	107.79 (12.11)	112.54 (12.20)	2.40	.017
Communication DQ	98.50 (10.46)	101.29 (11.78)	1.49	.137
Total DQ (GDQ)	95.55 (11.64)	101.10 (13.11)	2.64	.009

RESULTS:

Of the 230 children recruited, 125 (54.3%) were girls, and the mean age of the sample 6.99 yrs (SD=1.01). Most were from urban areas (57.2%), nuclear families (62.4%), and upper middle-class homes (72.2%). In terms of maternal education, a little more than two-thirds were graduates and post-graduates (67.4%) and one-fourth (24.3%) had a high school degree. A majority of the families reported owning a TV set and a mobile (98.7%), while 57.8% owned three screens (TV, mobile, computer). Most parents did not supervise the programs viewed by their children (71.5%), and imposed limits or rules regarding viewing (82.1%). The most preferred TV shows in order of preference were cartoons (96.5%), soap operas (16.7%), movies (15.9%), action (10.1%), and reality (7.5%) shows. Educational shows including news channels were rarely viewed (1.3%). Clearly, young children watched TV primarily for entertainment and not for increasing awareness or learning new skills. Parents were asked to list three potential positive and negative effects of watching TV. Some of the main advantages listed were greater access to information (20.4%), improved academic skills (10%), and enhanced vocabulary (12.6%). Interestingly, a little less than half (43%) of the parents did not list a single advantage of TV viewing. On the other hand, some of the disadvantages listed were adverse impact on the eyes (42.2%), modeling of aggressive and inappropriate behaviors (31.7%), and neglect of school work (17%).

The majority of the children watched TV for 1-2 h/day (77%) and the prevalence of TV viewing for 2 hours or more was 20%. A little more than one-fifth of the parents (21.9%) reported that their child had started to view the TV screen regularly by age 2. Significant differences were found between the early initiation of TV (≤24months) group of children and the later initiated group (>24months) on the sub-domains of the DP 3: physical DQ (t=2.05, P=.042), adaptive DQ (t=2.17, P=.031), social-emotional DQ (t=2.22, P=.028), cognitive DQ (t=2.40, P=.017), and GDQ scores (t=2.64, P=.009) (Table 1). Early initiation of TV (24months) tended to lower the DQs across several developmental domains, including the cognitive domain, as compared to children who started to watch TV at a relatively later age. No differences in developmental functioning were found between the groups defined by the duration of daily TV viewing.

We conducted a stepwise multivariate regression analysis to identify the significant predictors of the child's general

development quotient. The independent predictors included in the analysis were socioeconomic variables (the education level of the mother, the total number of children in the family, socioeconomic status), TV viewing related variables (age at initiation of TV viewing, mean duration of daily TV viewing, and mean duration of parental daily TV viewing time) and home environment score. Results indicated that four variables namely the number of children in the family, socio-economic status, age at initiation of TV viewing, and home environment explained 14.3% of the variance in the GDQ score (F=10.46, P=.0001). More children in the family, earlier age at regular TV viewing (before 2 yrs), lower socio-economic statuses, and poorer home environment were related to lower overall developmental functioning.

DISCUSSION:

The study aimed to understand the interrelationships between duration of TV exposure, the quality of the home environment, early initiation of television viewing, and developmental functioning. The results indicated that earlier initiation of TV was negatively associated with poorer developmental functioning. This association remained even after entering socioeconomic and home environment variables in the predictive equation. Several recent studies on infant and toddler exposure to screens have documented that early exposure to screens is associated with delays in expressive language skills, attention difficulties, and limited opportunities for parent-child verbal- and play-based interactions [17-19]. Research shows that children less than 2 yrs learn more efficiently and effectively through enriched face-to-face interactions with parents and are unlikely to learn from the TV at this young age [20]. Indeed, the American Academy of Pediatrics in their recent policy statement has recommended limiting use of screens in children less than 18 months and parents are advised to use only high-quality digital media together with their child [8].

Parents reported that 20% of the children started to watch TV screens regularly by age 2. Many studies conducted in several countries have reported early exposure to screens among infants and toddlers [21-22]. It is interesting to note that we did not find screen time per se related to worse developmental outcomes. Possibly, since the majority of the sampled children were engaging with the digital screens for only moderate amounts of electronic screen time duration (1-2 hrs daily). In this context it may be noted, in a study of 120115 adolescents, a moderate duration of screen time was associated with higher mental well-being as compared to low- or high-screen consumers [23]. Only high or low amounts of screen exposure were associated with negative outcomes and the 'digital Goldilocks hypothesis' proposes that moderate engagement in digital and technology activities may be of some benefit for children. Support for this hypothesis has been found in other studies as well [23-24]. The current media guidelines for children have been critiqued as they lack empirical support as 'less is not always better' across all the outcomes studied. Keeping in view the complexity surrounding screen time and growing research evidence, particularly regarding some potential positive benefits, a call for ongoing revision of the policy statement has been proposed [11,25]. The current findings add to the literature that early initiation may be particularly problematic and guidelines need to underscore this.

Research has further demonstrated that the cognitive functioning of young children may be impacted more by the kind of media experienced rather than exposure to the TV itself [11-12]. For example, Sanders et al., 2019 in a longitudinal study reported that passive screen time such as TV viewing was associated with worse outcomes on physical health, health-related quality of life, socio-emotional outcomes, and school achievement while educational and interactive screen time was related to positive educational outcomes of 10-11-year old [11]. Interestingly, hardly any child

sampled in the present study was watching educational TV shows.

Our findings further indicate that the poor home stimulation was a significant predictor of earlier initiation of screen viewing and poorer developmental functioning. Some of the correlates of excessive screen media use include maternal depression, excessive television viewing by parents, poor socio-economic status, and poor cognitive stimulation in the home environment [2, 21]. Moreover, a home environment culture that supports after-school TV viewing and where parents rarely supervise their children's TV viewing is associated with excessive TV viewing [26]. The critical importance of social and economic environment contexts in advancing the understanding of the possible developmental consequences of screen exposure has been noted previously [21, 27-28]. Children whose parents structure their time by engaging them in intellectually demanding and creative activities typically have better developmental and educational outcomes [29-30].

The primary drawback of the present study is that the amount of screen time was based on a proxy report and the age of initiation of TV was based on parental recall. Although previous studies have reported that parental recall of screen time is reliable, using objective measures such as TV diaries may have added to the strength of the study. The cross-sectional design limits the study's ability to draw inferences about causality. We only studied the child's exposure to the TV screen; however, parents reported that children were exposed to other modern digital screen devices like smartphones, tablets, and computers. It seems that TV may not be the only relevant screen in the lives of children and future research should examine time spent on other screens. The main strength of the study is a detailed individually administered multi-domain developmental assessment outcome measure along with home environment observational assessment.

In conclusion, the current findings support pediatric recommendations that very early initiation of digital media is associated with poorer developmental outcomes and it would be more prudent for parents to engage in quality one-to-one face interactions with children. The findings have considerable public health and policy implications as they underscore the need to foster healthy screen viewing habits in the early years. Additional research is needed to explore the linkages between electronic media consumption and indicators of cognitive, academic, and behavioral functioning in diverse samples. Pediatricians have a critical role in providing anticipatory guidance to parents regarding inculcating healthy digital screen viewing habits and at the same time encouraging more intellectually stimulating and enriching activities for young children, particularly during the stages of dynamic brain development.

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