

Effect of Television Exposure on Attention and Language in Preschool Children

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Aim

To evaluate the effects of television (TV) on language and attention in preschool children.

Introduction

There are contradictory reports of the effects of TV watching on children language, cognition, and attention. No research has been conducted to study these effects on Arabic-speaking children.

Patients and methods

A cross-sectional study was conducted on parents of preschool children with delayed language development aged 1.5–6 years recruited from the Phoniatic Unit in Sohag University Hospital. A total of 112 parents are asked if their children are watching TV, average duration of daily TV watching, type of programs, and if there is interaction during the day. All data are correlated with children language and attention.

Results

There is a strong negative correlation between receptive and expressive language age and inattention ($r=-0.8$) and the duration of TV watching ($r=-0.6$). This indicates that the poorer the inattention and the longer TV watching, the more unfavorable the results of receptive and expressive language age. There is a significant difference between certain types of song channels and inattention ($P=0.03$).

Conclusion

The quality of televised programs that promote language learning for preschool children should be encouraged in the Arabic-speaking society. Moreover, the duration of watching TV should be decreased to allow proper interaction of children with their parents and caregivers. Educating parents and increasing their awareness of the adverse effects of TV on their child's development, cognition, language, and attention should be pursued and addressed.

Keywords:

delayed language development, preschool children, television

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Introduction

Much research that focused on understanding the relation between television (TV) watching and language stated that TV cannot provide language learning [1–6]. Moreover, Zimmerman *et al.* [7] noted that TV watching has a significant relationship with language delay. Yet, Linebarger and Walker [8] stated 'Programs where onscreen characters speak directly to the child, actively elicit participation, label objects, and provide opportunities to respond, were positively related to expressive language production and vocabulary'. Therefore, it is important to view content, program type, and the average TV daily watching when describing media effects on language development.

In an experiment conducted by Kuhl *et al.* [9], American babies were able to discriminate certain sounds characteristic of Mandarin language after 12

sessions with Mandarin speakers, but another set of babies could not discriminate Mandarin speech sounds when language was taught through TV. The difference between both experiments was the social factor, indicating the importance of a social tutor in language learning [10].

John Baird, a Scottish engineer, is one of the inventors of the mechanical TV. He demonstrated the first working TV system in 1926 [11]. Since then, the use of TV gave rise to a passionate debate that still rages as some may consider TV a potent technical advancement in the field of education. The effects of TV put the debate into perspective. One conclusion

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that has been drawn through the years is that TV's effects on the quality of life on human being especially children are immense.

Four distinct components of attention are needed for language development as Gomes *et al.* [12] mentioned: *focus*, in which information is selected for processing; *sustain*, in which this focus is maintained over time; *shift*, in which attentive focus is moved to new information; and *encode*, in which information is mentally registered. All components of attention have a role in language acquisition. On the contrary, Ebert and Kohnert [13] reported through a meta-analysis that the difference between children with primary or specific language impairment and their typically developing peers was on tasks of sustained attention.

Phoniatic Unit in Sohag University receives large number of preschool children with delayed language development (DLD) watching considerably long hours of TV of different types of programs. No research was conducted to study the effects of TV on Arabic-speaking children. Hence, in this study, we wanted to understand watching patterns of TV in children and to evaluate the effects of TV on language, attention, and hyperactivity. Moreover, it is important to know if there is a social interaction between Egyptian mothers and their children or if they are depending on TV for language learning.

Patients and methods

This is a cross-sectional study of parents of children with DLD coming to the phoniatic unit seeking medical advice for their children. Inclusion criteria were as follows: age range of children was 1.5–6 years and children with DLD. At enrollment, the rationale of the study was discussed with the parents. Data were collected through face-to-face interview with parents. They were asked if their children are watching TV, average duration of daily TV watching, type of programs they are watching, and if there is interaction during the day. A total of 112 parents of children with DLD were included in this study.

All children were subjected to the following:

- (1) Intelligent quotient using Stanford Binet test (IV version) [14]. It had been administrated by the psychometrician.
- (2) Attention-deficit hyperactivity disorder test [15]: a range of values for the subtest standard scores (hyperactivity, impulsivity, and inattention) and the attention-deficit hyperactivity disorder (ADHD) quotient are provided for estimating

the probability of ADHD. It had been administrated by the psychometrician with the help of the parents.

- (3) Language evaluation by Arabic Preschool Language Scale-4 [16]. It had been administrated by the phoniatician.

The ethical considerations were addressed. The study was approved by the Ethical Committee of Faculty of Medicine, Sohag University, Egypt. All parents were given both written and oral information about the study. A written consent for participation was obtained from caregivers. Statistical analysis was conducted using SPSS program (version 16, Chicago). Pearson correlation coefficient and linear regression test were used.

Results

A total of 112 parents of children with DLD were included in this study. Mean of the age of the children is 36.35 months (\pm SD 14.1; Table 1).

Children are divided according to age into two groups: one group is up to 2 years and the other group is more than 2 years of age. Table 2 shows the mean duration of watching in each age group.

There is a significant difference between both groups (watching TV group children and nonwatching TV group children) in ADHD quotient and inattention ($P=0.03$ and 0.0005 , respectively), and the results show nonsignificant difference in hyperactivity and impulsivity ($P=0.86$ and 0.4 , respectively; Table 3). There is a significant difference between the duration of watching in minutes and inattention subscale ($P=0.04$; Table 4).

Table 1 Number and percentages of children watching different types of television programs

Types of programs	N (%)
Songs (Teyoor El Janna and Karamish)	14 (16)
Cartoons	13 (29.89)
Movies	8 (9.19)
Combined	36 (41.4)

Table 2 The mean duration of watching television in each age group

	Number of children (%)	Mean duration of watching (h)
Age of children \leq 2 years	20 (23.8)	3
Age of children $>$ 2 years	24 (28.5)	1–2
	40 (47.6)	5–6

Table 3 Attention-deficit hyperactivity disorder quotient, inattention, hyperactivity, and impulsivity subscales in both watching and nonwatching television children

	Watching [N (%)] 87 (100)	Nonwatching [N (%)] 28 (100)	P value
Attention-deficit hyperactivity disorder quotient	91.8	75.2	0.03*
Inattention	9	4	0.0005*
Hyperactivity	9.7	8.6	0.86
Impulsivity	10.3	9.1	0.4

Independent *t*-test is used. *statistically significant (*P* value < 0.05).

Table 4 Association between duration of watching television and attention-deficit hyperactivity disorder quotient and subscales of attention-deficit hyperactivity disorder test: hyperactivity, impulsivity, and inattention

	<i>t</i>	<i>P</i>
Attention-deficit hyperactivity disorder test	0.49	0.62
Hyperactivity	0.6	0.55
Impulsivity	-0.92	0.36
Inattention	-0.79	0.04*

Simple linear regression test is used. *statistically significant (*P* value < 0.05).

Table 5 The effect of different types of programs and inattention

Types of programs	Significance
Arabic Songs (e.g. Teyoor El Janna and Karamish channels)	0.03*
Cartoons	
Movies	
Combined	

One-way ANOVA analysis of variance is used. * statistically significant (*P* value < 0.05).

Using one-way ANOVA analysis of variance, there is a significant difference between types of programs and inattention (*P*=0.03; Table 5). Post-hoc test is used and revealed that Arabic songs differed significantly from other programs.

Table 6 shows that there is a significant difference between interaction of the parents with their children and inattention (*P*=0.042), indicating the effect of interaction on decreasing inattention.

There is a strong negative correlation between receptive and expressive language age and attention ($r=-0.8$) and the duration of TV watching ($r=-0.6$).

Discussion

In this study, three-fourths of the children with DLD watch TV, and the average daily TV watching time in children aged 2 years and younger was 3 h/day, whereas almost half of the children older than 2 years watched 6 h/day. The average American child between the ages of 8 months and 8 years is exposed to almost four hours of background TV per day [17], whereas a survey

Table 6 The effect of parental interaction on attention-deficit hyperactivity disorder quotient and subscales of attention-deficit hyperactivity disorder test: hyperactivity, impulsivity, and inattention

	Coefficient	Standard error	<i>t</i>	<i>P</i>
Constant	1.225	0.64	1.914	0.065
Attention-deficit hyperactivity disorder test	-0.0169	0.0125	-1.353	0.186
Hyperactivity	-0.0519	0.0361	-1.436	0.161
Impulsivity	0.035	0.0404	0.868	0.392
Inattention	0.108	0.051	2.122	0.042*

Simple linear regression test is used. *statistically significant (*P* value < 0.05).

conducted by Rideout and Hamel [18] stated that children spend an average of 59 min a day watching TV, and despite the prevalence of new media, young children spend most of their screen time with TV. For children aged 2 years and younger, there are adverse cognitive [2,19,20], behavioral, and physical health effects [21] associated with TV watching in early childhood. In an epidemiological study on 8–16-month-old infants in the USA, watching more than 1 h of video per day had a negative association with vocabulary acquisition [7]. American Academy of Pediatrics [22] recommended that children under the age of 2 years do not watch TV and that older children watch only 1 or 2 h per day.

Trying to know why parents leave their children spend long hours in front of TV, 80% of parents wanted to keep their children quiet, avoid hyperactivity and screaming, and keep them engaged while finishing their household chores. This poor parenting style has first been reported in earlier studies [23], indicating that attitudes of parents toward their children have not been changed along the years despite media education. However, the rest of parents believed that TV could help in learning and educating their children some useful information such as letters and numbers. Certain and Kahn [24] have shown that parents believed that media could offer a positive learning environment, whereas Dalzell *et al.* [25] viewed that parents believed that TV could improve a child's vocabulary.

Overall, 41% of children are watching combined types of programs (songs, cartoon, and movies), but none of them are watching programs that use strategies known to evoke language in live interaction situations. Grella *et al.* [5] noted 'Toddlers who watched a program with poor language models and little elicitation of participation or communication were not able to learn new words'. On the contrary, Linebarger and Walker [8] examined the effects of watching certain types of programs on language in a 6–30-month-old child watching and revealed that programs where onscreen characters speak directly to the child, actively elicit participation, label objects, and provide opportunities to respond, were positively related to expressive language production and vocabulary. Grella *et al.* [5] mentioned 'Support for relationships between televised stimuli and word learning has been found with toddlers. For example, toddlers were able to learn novel words from a televised model better if the model used strategies known to support language learning in live situations (e.g. televised model vocalized to obtain the child's attention and then labeled a particular object)'. There are few Arabic-speaking programs that have storybook-like nature with strong narrative to help children engage. Hence, the production of programs that are visually attractive and yet give opportunities to hear vocabulary and see the visual representation of the vocabulary word should be encouraged for the purpose of both language learning and entertainment.

The results showed that watching TV affected the scores of ADHD quotient and Inattention. This is in agreement with many studies that noted that TV watching has harmful effects on such cognitive abilities such as attention and reading [26,27]. Moreover, Schmidt *et al.* [28] and Thompson and Christakis [29] have noted that early exposure to TV has been connected to attention disorders. In this study, there is a significant difference between watching certain types of program such as Arabic songs (e.g. Teyoor El Janna and Karamish channels) and inattention. Possibly, certain aspects of TV – like the fast pace or rapid change of scenes – might contribute to the development of short attention spans [30]. In the Arab world, there are many channels such as 'Teyoor El Janna' and 'Karamish' that are characteristic of the fast pace affecting attention to a great extent.

In this study, there is a strong negative correlation between receptive and expressive language age and inattention. Parents talk and play with their infants less often when the TV is on, even in the background; therefore, they become less attentive and engaged. The

language delay can be attributed to difficulty with focused and sustained attention to the voice and sounds in the environment [31]. It is not conclusive whether language delay was the cause or the result of inattention. If the child's inattentiveness or hyperactive or impulsive behavior disrupts joint attention activities, parental language models such as expansions and extensions may be less effective in advancing language [32].

There is significant difference between interaction of the parents with their children and inattention and language. This is because children's early development depends on responsive parenting. More time in front of the screen means less time for play and shared activities. Parents may resort to TV to control hyperactivity and to get rid of the disturbing hyperactivity, not knowing that most TV programs are passive and may add to language impairment and inattention [33]. Hart and Risley [34] have noted that the amount of talk mothers direct at their children is strongly related to children's vocabulary growth. Some evidence for the under twos suggests that children's comprehension and vocabulary are extended more effectively by one-to-one interaction with adults than by TV and that extensive exposure to TV may mean that interaction with adults is reduced [35].

Conclusion

The quality of televised programs that promote language learning for preschool children should be encouraged in the Arabic-speaking society. Moreover, the duration of watching TV should be decreased to allow proper interaction of children with their parents and caregivers. Educating parents and increasing their awareness of the adverse effects of TV on their child's development, cognition, language, and attention should be pursued and addressed.

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Conflicts of interest

There are no conflicts of interest.

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