Intelligence Skills of Children with Delayed Speech and Other Factors Affecting Language Development

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Abstract

Aim: The aim of the study is to investigate intelligence skills of the children who have delayed speech and other factors affecting language development.

Material and Method: In the range of 3-6 years children who have delayed speech (N:31) and 30 control group who haven't delayed speech were assessed in Hacettepe University Hearing and Speech Training Center. Speech and language skills of children were assessed with Turkish Preschool Language Scale-5 (TPLS-5) and the intelligence abilities of them intended to measure with Stanford-Binet Intelligent Test.

Results: There were not statistically significant differences between two groups according to intelligence skills (p>0.05). However, there were significant differences between control and experimental (children with delayed speech) according to specific variables (p<0.05). These variables were; the person responsible for the care of the child, daily watching TV levels and speech intelligibility of the children.

Conclusion: The current study implies that; hearing loss, delay in cognitive development, lack of psychosocial stimuli cause to delayed speech. For this reason, the children who diagnosed with speech delay should be test out with age-appropriate intelligent tests in order to determine their intelligence levels. In other words, it is essential to directly focus to the underlying reasons of the delayed speech before organizing the therapy.

Keywords: Speech; Delayed speech; Children; Intelligence; Language and speech development; Assessment

Introduction

Delayed speech is one of the most encountered problem in which language and speech development period does not proceed in accordance with normal development period and in atypical (not normal) childhood. Delayed speech affects the child's cognitive, emotional and social life to a large extent. At the same time, academic achievements and the compatibility in social life of the child are affected in a negative way by language and speech delay, problems arise out of different levels in verbal communication, communication, language usage and learning speaking in future periods [1,2]. When considered from developmental point of view, neurologic, biological, psychosocial, cognitive and psychosexual developments comprise at the same time by affecting closely each other. Infants generally have listening experience of speaking until the end of the first year and give some signs (gestures, smile, crying) about that they comprehend the meaning of language [3]. Children are active participants in phonetic, syntax, semantic and pragmatics education. The education given by mother that is a dynamic way for children in the first years has importance in accordance with social interaction, play and brain development, normal hearing, development of intelligence and development of speaking. As all these development periods are affected

in a negative way, a delay in development periods expected in language and speech can occur [4].

Hearing loss, mental retardation and stimulus deficiency are main the most frequently encountered reasons of the delayed speech. A child with hearing loss is under the risk of having problems for understanding the verbal language and expressing herself/himself verbally. The child will encounter some problems like learning disability, isolating herself/himself socially when the communication problem is treated as early response. Mental retardation has an important place within the impeding conditions for the language and speech development of children. Mental retardation can be explained as being below the average of adjustment disorder and mental functions of child. Another reason leading speech problem is that children are excessively left alone by preventing receiving the stimulus [3,4]. In addition to this, speech development can fall behind among the children who live, especially, in nursing home by themselves, who have not much people around them, who have careless adults and who have no children around them. Some conditions like cutting themselves off from the outside world, the tendency of being alone, withdrawal from people and the relation between people, abandoning emotional exchange, not talking, not looking when calling can develop for children who abandoned to watch only TV (watching long duration clip, film or commercial) because of lacking human relations at young ages and interest. In parallel with this, they are probable reasons that speech of children cannot develop or can regress after

developed [5]. For this reason, it is extremely important to find the underlying reason for the children who admit with delayed speech complaint. It is necessary to apply intelligence test suitable for age level of the child with the purpose of taking detailed medical history form the family during the evaluation stage, evaluating the hearing with audiological tests, determining the receptive and expressive language age of the child by applying language test and eliminating the probable intelligence problems. In the light of this information, it has been aimed in our study to compare intelligence skills of children who have speech delay aged between 3-6 and of children who have normal language and speech skills.

General Information Form

"General Information Form" consists of questions for child and parents. Questions about chronological age, gender, educational level of the parents and their occupations, number of siblings, age of the toilet training acquisition, the age suspected for speech delay, the moment of the birth, the condition in pre-school education and pre-school institution have been in the form for being able to determine the factors which could affect the speech developments of the participant children [6,7].

Stanford-Binet Intelligence Test

This test is applied individually from age two through mature adulthood. It was developed in 1905 by Stanford-Binet and Theodore Simon. This test has been revised for four times until today. Stanford-Binet test has 15 different subtests. These subtests were regulated to evaluate four cognitive skills accepted as the indicators of intelligence. These skills are verbal reasoning, abstract/visual reasoning, quantitative reasoning, and short-term memory. This test takes nearly 30 min for little children and nearly 60-70 min for elders [8-10].

Stanford-Binet test does not depend on a period of time. Intelligence parts have been scored respectively as profound mental retardation 20 and below, severe mental retardation 21-35, moderate mental retardation 36-50, mild mental retardation 51-69, borderline impaired or delayed 70-79, dull intelligence 80-89, normal intelligence 90-109, high average 110-119, superior intelligence 120-129 and very superior intelligence 130 and above points [8,9].

Stanford- Binet test was applied to children individually. First of all, the it was started to the test with the questions which were under the expected mental age as a standard. If the child failed in a question, it was continued with the previous levels until getting successful and the level in which the child was successful was accepted as basal age. After that, it was continued with the higher levels questions, the test was applied until the child was totally unsuccessful. The test was terminated at the level that the child was unsuccessful [8-10].

Statistical Analysis

It has been aimed in our study to determine the scores of intelligence part of the working and control group and the effects of the factors like age, gender, educational level of the parents and their occupations, siblings and the moment of the birth on the scores of intelligence part. Mean, median, minimum, maximum, standard deviation and peak value for continuous variables have been calculated. For testing whether there has been any difference between groups in terms of continuous variables or not, T-test was applied among independent samples in which parametric test assumptions were ensured, Mann Whitney U test was applied when the assumptions were not ensured. Crosstabs have been created for categorical variables. For testing whether there has been any significant difference between groups, Pearson Ki-Kare Test was applied when the parametric test assumptions were ensured, Likelihood Ratio Test was applied when the assumptions were not ensured.

Results

This study has been conducted to determine the mental competence of the children with delayed speech and without delayed speech by applying Stanford-Binet intelligence test, and to determine the effects on speech delay. While 21 of 31 children diagnosed with speech delay were boys and 10 of them were girls, 13 of 30 children were boy and 17 of them were girls in the control group. In Table 1, descriptive values between variables like gender of the child, educational level of mother, educational level of father, employment status of mother, economic condition of family and social security, number of children, types of family, and patients and control groups have been indicated.

		Patient Group	Control Group	Total	p
Sex	Boy	21	13	34	0.06
	Girls	10	17	27	
	Total	31	30	61	
Mother's education level	Primary and secondary school	7	12	19	0.30
	High school	10	9	19	
	Undergraduate and graduate	14	9	23	
	Total	31	30	61	
Father's education level	Primary and secondary school	6	11	17	0.29
	High school	14	9	23	
	Undergraduate and graduate	11	10	21	

	Total	31	30	61	
Working condition of the mother	Yes	11	10	21	0.86
	No	20	20	40	
	Total	31	30	61	
Income of the family	Minimum wage	7	4	11	0.56
	Minimum wage x 2	12	15	27	
	Minimum wage x 3	12	11	23	
	Total	31	30	61	
Economic situation of the family	Low & medium	15	18	33	0.36
	Good & Very good	16	12	28	
	Total	31	30	61	
Number of child	1 child	11	12	23	0.90
	2 children	16	15	31	
	3+ children	4	3	7	
	Total	31	30	61	
Family type	Nuclear family	25	23	48	0.70
	Extended family	6	7	13	
	Total	31	30	61	

Table 1: Comparison of patient and control groups in terms of categorical variables.

In Table 2, descriptive values between variables like the moment of birth of the child, child care provider, the case of attending pre-school and nursery, the duration of watching TV daily, the duration of playing computer, comprehensibility of speech of the child by foreigners, and patients and control groups have been indicated. When Table 2 has been examined, there has been a statistically difference (p>0.05) in terms of the duration of watching TV (p:0.02) and comprehensibility of speech of the children by foreigners (p:0.00) between patients and control groups. It has been observed that most of the children (N:23) in the group with speech delay have watched TV more than one hour a day. While the average duration of watching TV daily of the children with speech delay has been 3.45 hours, it has been 1.87 hours in the control group.

		Patient Group	Control Group	Total	p
Birth order of the child	1	16	15	31	0.88
	2 and/or +	15	13	28	
	Total	31	28	59	
Caregiver	Mother	29	23	52	0.06
	Other (grandmother etc.)	2	7	9	
	Total	31	30	61	
Kindergarten	No	7	5	12	0.56
	Yes	24	25	49	
	Total	31	30	61	
Child's duration of watching TV in the day	No	1	6	7	0.02

		Patient	Control	Total	
	Up to 1 h	7	12	19	
	More than 1 h	23	12	35	
	Total	31	30	61	
Child's computer use time in the day	No	12	14	26	0.47
	Up to 1 h	11	12	23	
	More than 1 h	8	4	12	
	Total	31	30	61	
The intelligibility of the child's speech by strangers	No	17	1	18	0.00
	Yes	14	29	43	
	Total	31	30	61	

Table 2: Comparison of patient and control groups in terms of categorical variables.

In Table 3 demographic information and the difference between patients and control groups have been indicated. The age average of the children in patient group (having delayed speech) has been 53.87 month (SS: ± 10.62), it has been 58.33 month in control group (SS ± 9.34). The age average of the mother of children in patient group has been 32.61 (SS: ± 4.86), fathers' age average has been 37.4 (SS: ± 6.17), the mothers' age average in control group has been 31.63 (SS: ± 4.34) and fathers' has been 34.20 (SS: ± 4.44). While the month average of holding their heads up of the children with speech delay has been 2.16, it has been 3.00 in the control group (Table 3). When the both groups have been analyzed, it has been seen that children with speech delay have fallen behind with holding heads up, walking and toilet training than normal children, and these delays have been statistically found significant (p=0.013; p=0.014; p=0.002).

The averages of the scores of Stanford-Binet intelligence test between patient and control groups have not been statistically found significant (p>0.05) (Table 4). As the minimum intelligence point in patient group has been 56, it has been 90 in control group. In addition to this, maximum intelligence point has been 139 in patient group and 140 in control group.

	Patient Group	Control Group	Total	p
Maximum	139	140	140	0.143 (p>0.05)
Minimum	56	90	56	
Median	102.00	109.50	107.00	
Mean	103.71	110.67	107.13	
Standard Deviation	20.83	15.21	18.47	
Peak value	80	90	90	

Table 4: Comparison of patient and control groups according to scores of the Stanford-Binet Intelligence Test.

In Table 5, there has been a crosstab compared the children in patients and control groups according to the Sub-intelligence fields of Stanford-Binet Test. For testing whether there has been any significant difference between groups, Ki-Kare Test was applied when the parametric test assumptions were ensured, Likelihood Ratio Test was applied when the assumptions were not ensured. When the table was analyzed, statistically significance difference (p<0.05) has been found in the subfields between groups as Instant Auditory Attention (p: 0.002), Visual Memory (p:0.034), Concept Skill (p:0.00), Fine Motor Skills (p:0.011).

	Patient Group		Control Group		p
	n	Mean	SD	n	Mean	SD	

	Patient Group			Control Group			p
	n	Mean	SD	n	Mean	SD	
Age of child (month)	31	53.87	± 10.62	30	58.33	± 9.34	0.087
Age of mother	31	32.61	± 4.86	30	31.63	± 4.34	0.410
Age of father	31	37.45	± 6.17	30	34.20	± 4.44	0.022
Age of holding the child's head	31	2.16	± 1.24	30	3.00	± 1.31	0.013
Age of walking of child	31	14.68	± 5.08	30	12.07	± 2.55	0.014
Child's toilet training age	30	30.53	± 7.88	30	24.90	± 4.96	0.002

Table 3: Normative values and differences between patients and control groups according to the some variables belonged to child and parents.

	Patient Group	Control Group	Total	p
Instant Auditory Attention (+)	4 (12.9%)	15 (50.0%)	19 (31.1%)	0.002 (p<0.05)
Instant Auditory Attention (-)	27 (87.1%)	15 (50.0%)	42 (68.9%)	

Arithmetic Skill (+)	6 (50.0%)	13 (52.0%)	19 (51.4%)	0.909 (p>0.05)
Arithmetic Skill (-)	6 (50.0%)	12 (48.0%)	18 (48.6%)	
Hand-Eye Coordination (+)	8 (30.8%)	14 (50.0%)	22 (40.7%)	0.151 (p>0.05)
Hand- Eye Coordination (-)	18 (69.2%)	14 (50.0%)	32 (59.3%)	
Visual Separation (+)	19 (63.3%)	22 (73.3%)	41 (68.3%)	0.405 (p>0.05)
Visual Separation (-)	11 (36.7%)	8 (50.0%)	19 (31.7%)	
Visual attention (+)	25 (80.6%)	26 (86.7%)	51 (83.6%)	0.525 (p>0.05)
Visual attention (-)	6 (19.4%)	4 (13.3%)	10 (16.4%)	
Visual Memory (+)	22 (81.5%)	24 (100.0%)	56 (90.2%)	0.034 (p<0.05)
Visual Memory (-)	5 (18.5%)	0 (0.0%)	5 (9.8%)	
Concept Skill (+)	8 (26.7%)	20 (69.0%)	28 (47.5%)	0.001 (p<0.05)
Concept Skill (-)	22 (73.3%)	9 (31.0%)	31 (52.5%)	
Orientation in space (+)	27 (90.0%)	24 (88.9%)	51 (89.5%)	0.892 (p>0.05)
Orientation in space (-)	3 (10.0%)	3 (11.1%)	6 (10.5%)	
Short Term Memory (+)	1 (50.0%)	2 (83.3%)	11 (78.6%)	0.327 (p>0.05)
Short Term Memory (-)	1 (50.0%)	10 (16.7%)	3 (21.4%)	
Abstraction (+)	11 (42.3%)	17 (56.7%)	28 (50.0%)	0.284 (p>0.05)
Abstraction (-)	15 (57.7%)	13 (43.3%)	28 (50.0%)	
Verbal Expression (+)	5 (41.7%)	13 (52.0%)	18 (48.6%)	0.556 (p>0.05)
Verbal Expression (-)	7 (58.3%)	12 (48.0%)	19 (51.4%)	
Fine Hand Coordination (+)	10 (38.5%)	14 (50.0%)	24 (44.4%)	0.394 (p>0.05)
Find Hand Coordination (-)	16 (61.5%)	14 (50.0%)	30 (55.6%)	
Fine Motor Skills (+)	14 (56.0%)	26 (86.7%)	40 (72.7%)	0.011 (p<0.05)
Fine Motor Skills (-)	11 (44.0%)	4 (13.3%)	15 (27.3%)	

Table 5: Comparison of patient and control groups with Stanford-Binet Test in terms of sub intelligence areas.

It can be said that if the r-value calculated as a result if Pearson Correlation test was positive, there would be a positively relation (if one variable rises the other variable also rises); if it was negative, there would be a negatively relation (when one variable decreases as the other one decreases, too). The power of the relation has been evaluated in 5 categories according to the classification [11]. Pursuant thereto, there has been a strong relation between the coefficients of correlation as: between 0.00-0.19: 'very weak', between 0.20-0.39: 'weak', between 0.40-0.59: 'moderate', between 0.60-0.79: 'strong', between 0.80-1.0: 'very strong'. In the light of this information, the following data has been achieved.

Chronological age	N	Correlation coefficients (r)
Find Hand Coordination	54	0.537
Arithmetic Skill	37	0.505
Instant Auditory Attention	61	0.434

Table 6: Correlation between chronological age and fine hand coordination, arithmetic skill and instant auditory attention.

When Table 6 has been examined, it has been seen that there have been positive and medium level relations between chronological age and fine hand coordination, arithmetic skill and instant auditory attention.

When Table 7 has been examined, a negative relation has been determined between arithmetic skill (r:-0.507) and diagnosed age of speech delay, as there have been positive and medium level relation between diagnosed age of speech delay, fine hand coordination (r: 0.599), visual memory (r:0.544), instant auditory attention (r:0.444) and spatial orientation (r:0.402).

Conclusion

Language development is a kind of developmental period starting with birth. Child is within the psychosocial and psychomotor developmental period from the moment they are born. Psychosocial development, social relation development, intelligence and learning skills should be normal development level expected according to the age. While receptive language is described as hearing the language and understanding it as well as verbal understanding by the audience; expressive language is a language produced by the speaker contrary to receptive language. Expressive and receptive language should be in direct proportion to age of the child in normal development period [12-14].

Age of Diagnosis	N	Correlation Coefficients (r)
Find Hand Coordination	26	0.599
Visual Memory	27	0.544
Instant Auditory Attention	31	0.444
Orientation in space	30	0.402
Arithmetic Skill	12	-0.507

Table 7: Correlation between diagnosed age of speech delay and fine hand coordination, visual memory, ınstant auditory attention, spatial orientation and arithmetic skill.

Ozsoy et al. have found in their study that the language development level of children with mental retardation has been lower than the mental age level. Furthermore, they have found that receptive language level of children with mental retardation has been higher than expressive language level. They have started to speak later than contemporaries; speaking has proceeded slowly depending on defect level. Also, they have had language and speech problems [14].

Stanford-Binet Intelligence Test scores have been used to determine the intelligence points of 61 children who with speech delay and without speech delay. Stanford-Binet Intelligence Test developed in 1905 as an objective assessment instrument for identifying the different levels of mental retardation by Alfred Binet and Theodore Simon. The original of Stanford-Binet Intelligence Test has reached the present day by extending. The standardization of the latest version which is used today has done by applying on 2000 children [15]. Saylor et al. have emphasized in their study that Stanford-Binet intelligence test has had an extensive importance in the studies of intelligence about pediatric population and has given trustful results [16]. It has been aimed in our study to identify the different fields by comparing the points of intelligence part of children with speech delay and without speech delay. In accordance with this purpose, the main result

showed statistically significant difference between groups has been the ages of holding their heads up, walking and toilet training. Yapıcı et al. has said that the age of holding the head up has occurred in the period of 0-3 month, walking has occurred between 12-18 month and toilet training has occurred in the period of between 24 and 36 month [17]. A statistically significant difference (p<0.05) has been observed in terms of holding the heads up, walking and toilet training between two groups in our study. This has been a distinguishing finding for speech delay.

Feldman et al. has found that starting the articulation of the child has showed a rapid increase with maternal love consisted of feedbacks as parental education, verbal instructions, modeling, compliment and mimic; however, only verbal instructions have not been enough for creating significant acquisition when they researched the effects of parental education on language education of the child [18]. In the light of this information, we can say that parental education, gender, average income of the family or social security of the child have not been effected on the speech delay but the concern shown by parents and loving environment have had more effect on the child with regard to data obtained from our study. In addition to this, there has been a significant difference (p<0.05) between patient and control groups in terms of the variables like the person who has been responsible for the child care, how many hours the child has watched TV and comprehensibility of speech of the child by foreigners.

Asplund et al. has found in their study that parents and children who have spent more times on TV have been exposed to obesity, communicative disorders and negative health requirements [19]. Verloigne et al. have indicated in the study conducted in Hungry, Greece, Norway and Belgium in 2015, children have had low sense of self who watched long hours television than who watched television less, as well as parents have showed less concern than needed [20].

According to American Academy of Pediatrics, watching TV more than 1 or 2 h in a day is harmful for children, as well as it has been informed that children who watch more television have some problems like depersonalization for suffering of other people's pain or distress, developing fear against society and various incidents, having the tendency for developing aggressive or impairing behavior, the problem of having over-weight because of spending so much time in front of television and the most importantly having communication problem with their family, society due to watch television perpetually and not knowing how to communicate with other people [21]. We can say that children who watch television for long hours have speech delay, this can be connected with lack of communication during early childhood as well as we can explain that the communication problem between the child and the person who has been responsible for the child care allow children to watch much more television. In the study of Altinkilic and Ozhan, negative effects of TV-watching upon the health of children aged 1-6 and to explore mothers' attitudes and behaviors about TV-watching have been descriptively undertaken. The sample of the study was composed of 353 mothers who had children aged 1-6 years. It was found out that most of the children watched TV for ≥ 2 h and 61.2% of them had health problems (particularly; eye and sleep problems) in case they watched TV for long hours [22].

In the study of Liao et al., data of verbal IQ and non-verbal performance IQ has been compared on three children groups. Groups have comprised of children with normal language development, with subnormal language development and with language disorder. They have indicated that performance IQ levels among three groups have been better than verbal IQ values in their study. Performance IQ values

have been found lower in children with developmental language disorder and special language problems than values of children with normal language development and they have indicated that total IQ scores of children with language disorder has been lower than the scores of children with normal language development [23]. In the study conducted in Kent State University, the quality of language has been evaluated as three approaches as cognitive, neurodevelopmental and the combination of two groups. Cognitive developments of children participated in the study have been evaluated with Stanford-Binet intelligence test, neurodevelopmental levels, as well, have been evaluated according to small motor movements, dichotic speech processing and chronological age. They have found that language scores in the combinations of chronological age and mental age have been in equal level in statistical results. As a result of their study, verbal cognitive skills and fine motor movements have shown increase in children with language and speech delay in addition to chronological age [24]. In our study, 50.0% of the children in control group have had better fine hand coordination, as fine hand coordination skills have been fine in 38.5% of the children in patient group. The divergence between rates has not been found statistically significant (p>0.05) as a result of applied test. In the light of this information, when it is thought that hand-eye coordination is related with the age of child, we can say that the development of concept knowledge can progress as long as the child becomes older, and the language learning process is related with this development in the same direction.

References

1. Bishop D, Leonard L (2014) Speech and Language Impairments in Children: Causes, Characteristics, Intervention and Outcome. Psychology 22: 442-443.

2. Hawa VV, Spanoudis G (2014) Toddlers with Delayed Expressive Language: An Overview of the Characteristics, Risk Factors and Language Outcomes. Res Dev Disabil 35: 400-407.

3. Feldman H (2005) Evaluation and Management of Language and Speech Disorders in Preschool Children. Pediatr Rev 26: 131-141.

4. Law J, Boyle J, Harris F, Harkness A, Nye C, et al. (2000) Prevalence and Natural History of Primary Speech and Language Delay: Findings from a Systematic Review of the Literature. Int J Lang Comm Dis 35: 165-188.

5. Ozsoy Y (1987) Speech Disabilities, Special Needed Children. Special Education Introduction. (8th Edition) Ankara: Karatepe Publications.

6. Zimmerman IL, Steiner VG, Pond RE (2011) Preschool Language Scale–Fifth Edition (PLS–5). San Antonio, TX: Pearson.

7. Sahli AS, Belgin E (2017) Adaptation, validity, and reliability of the Preschool Language Scale- Fifth Edition (PLS-5) in the Turkish context: The Turkish Preschool Language Scale-5 (TPLS-5). Int J Pediatr Otorhinolaryngol 98: 143-149.

8. Braden JP, Elliott SN (2003) Accommodations on the Stanford-Binet Intelligence Scales, Fifth Edition. Riverside Publishing, Itasca.

9. Ruf DL (2003) Use of the SB5 in the Assessment of High Abilities. Stanford-Binet Intelligence Scales, Fifth Edition Assessment, Riverside Publishing, Itasca.

10. Beker KA (2003) History of the Stanford-Binet Intelligence Scales: Content and Psychometrics. Stanford-Binet Intelligence Scales, Fifth Edition Assessment. Riverside Publishing, Itasca.

11. Evans JD (1996) Straightforward Statistics for the Behavioral Sciences. Pacific Grove, CA: Brooks/Cole Publishing.

12. Demir O, Ozmen KS (2012) An Investigation of the Opinions of The Primary Education Students About the Attention Collecting Process. Cukurova Univer Social Sci Inst J 21: 135-154.

13. Bauchner H (2006) Screening for Speech and Language Delay in Preschool Children: Recommendation Statement. Pediatrics 117: 497-501.

14. Ozsoy Y, Ozyürek M, Eripek S (1997) Introduction of Special Education Karatepe Publications, Ankara.

15. Ugurel R (1987) Application of the Stanford-Binet Scale to the Children of Istanbul.

16. Saylor CF, Boyce GC, Peagler SM, Callahan SA (2000) Caution Against Using the Standford-Binet to Classify High-Risk Preschoolers. J Pediatri Psychol 25: 179-183.

17. Yapıcı Z (2008) Overview of Neurological Development and Examination in Child.

18. Feldman MA, Case L, Rincover A, Towns F, Betel J, et al. (1989) Parent Education Project. III: Increasing Affection and Responsivity in Developmentally Handicapped Mothers: Component Analysis, Generalization, and Effects on Child Language. J Appl Behav Anal 22: 211-222.

19. Asplund KM, Kair LR, Arain YH, Cervantes M, Oreskovic NM, et al. (2015) Early Childhood Screen Time and Parental Attitudes Toward Child Television Viewing in a Low-Income Latino Population Attending the Special Supplemental Nutrition Program for Women, Infants, and Children. Child Obes 11: 590-599.

20. Verloigne M, Van Lippevelde W, Bere E, Manios Y, Kovács É, et al. (2015) Individual and Family Environmental Correlates of Television and Computer Time in 10 to 12-Year-Old European children: The ENERGY-Project. BMC Public Health 15: 912.

21. American Academy of Pediatrics (AAP) (2018).

22. Altınkilic Z, Ozkan H (2014) Determination of mothers' attitudes and behaviors about the effects of TV-watching upon the health of children aged 1-6 years. Behçet Uz Çocuk Hast Dergisi 4: 186-194.

23. Liao SF, Liu JC, Hsu CL, Chang MY, Chang TM, et al. (2015) Cognitive Development in Children with Language Impairment, and Correlation between Language and Intelligence Development in Kindergarten Children with Developmental Delay. J Child Neurol 30: 42-47.

24. Sommers RK (1991) Approaches to the Prediction of Language Abilities in a Sample of Children Who Have Developmental Delays. J Speech Hear Res 34: 317-324.