Comparison of Language Development, Emotional and Behavioral Problems, Parental Attitude Characteristics, Parental Stress Level and Related Factors in Preschool Period, Between Preterm and Term-Born Children

Preterm ve Term Doğan Çocuklarda Dil Gelişimi, Duygusal ve Davranışsal Sorunlar, Ebeveyn Tutum Özellikleri, Ebeveyn Stres Düzeyi ve İlişkili Faktörlerin Okul Öncesi Dönemde Karşılaştırılması

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ABSTRACT

Objective: We aimed to investigate language development, emotional and behavioral problems, parental attitudes, parental stress levels, and related factors in preschool period between children who were born preterm and term.

Material and Methods: We included 176 children, of whom 90 were born preterm and 86 term, and their mothers. Mothers filled out the sociodemographic data form, Child Adjustment and Parent Efficacy Scale (CAPES-TR), Parenting Stress Index-Short Form (PSI-SF), and Parenting Styles and Dimensions Questionnaire – Short Version (PSDQ) scales. Denver II Developmental Screening Test (DDST) and Test of Early Language Development - Third Edition (TELD-3) were applied to children.

Results: The mean age was 37.97±3.62 months for the preterm children, and 38.77±3.28 months for the term children. The scores of preterm children were lower in the TELD-3 subtests. The rates of children with abnormal development regarding personal social development and language development were significantly higher in preterm children ($p=0.007$ for personal social development and <0.001 for language development, respectively). CAPES-TR emotional and behavioral problems scores were higher in preterm children. CAPES-TR Parental Self-Efficacy Subscale was lower in preterm children ($p<0.001$). PSI-SF total score and PSDQ permissive parenting subscale score were higher in mothers of preterm children ($p=0.005$ and $p<0.001$, respectively). The preterm-born children were more commonly diagnosed with language disorder and global developmental delay ($p=0.006$ and $p=0.019$, respectively). A positive correlation was found between the week of birth, maternal education level and monthly income level and TELD-3 scores, DENVER personal social and language development level ($p<0.050$).

Conclusion: Our study revealed closer follow-up is important for preterm children to plan special education support when it is necessary.

Key Words: Behavioral problems, Language development, Parenting attitude, Parenting stress, Prematurity

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Conflict of Interest / *Çıkar Çatışması*: On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethics Committee Approval / *Etik Kurul Onayı*: This study was conducted in accordance with the Helsinki Declaration Principles. Ethics committee approval was obtained from Uludag University with the date 26.05.2021 and number 2021-6/8.

Contribution of the Authors / Yazarların katkısı*: *GÜLLER B: Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the Conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***YARCI E:*** Constructing the hypothesis or idea of research and/or article, Reviewing the article before submission scientifically besides spelling and grammar. ***YAYLACI F:*** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the Conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in necessary literature review for the study, Reviewing the article before submission scientifically besides spelling and grammar.

How to cite / *Atıf yazım şekli* : Güller B, Yarcı E and Yaylacı F. Comparison of Language Development, Emotional and Behavioral Problems, Parental Attitude Characteristics, Parental Stress Level and Related Factors in Preschool Period, Between Preterm and Term-Born Children. Turkish J Pediatr Dis 2023;17:233-242.

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Received / Geliş tarihi : 23.09.2022
Accepted / Kabul tarihi : 16.01.2023
Online published : 01.03.2023
Elektronik yayın tarihi
DOI: 10.12956/tchd.1179344

ÖZ

Amaç: Çalışmamızın amacı yeni doğan yoğun bakım ünitesinde yatmış olan preterm ve term doğan çocuklarda okul öncesi dönemde dil gelişimi, duygusal ve davranışsal sorunlar, ebeveyn tutumları, ebeveyn stres düzeyleri ve ilişkili faktörleri araştırmaktır.

Gereç ve Yöntemler: Çalışmamız 90 preterm ve 86 term olmak üzere 176 çocuk ve annesi ile yapıldı. Anneler sosyodemografik veri formu, Çocuk Uyumu ve Anne baba Yeterlik Ölçeği (CAPES-TR), Anne Baba Stres Ölçeği-Kısa Form (ABSÖ-KF) ve Anne babalık Stilleri ve Boyutları Ölçeği-Kısa Form ölçeklerini doldurdu. Tüm çocuklara Denver II Gelişimsel Tarama Testi (DGTT) veTürkçe Erken Dil Gelişim Testi (TEDİL) uygulandı.

Bulgular: Preterm çocukların yaş ortalaması 37.97±3.62 ay, term çocukların 38.77±3.28 aydı. TEDİL alt testlerinde preterm çocukların skorları daha düşüktü. Erken doğmuş çocuklarda kişisel sosyal gelişim ve dil gelişimi açısından anormal gelişim gösteren çocukların oranı daha yüksekti (kişisel sosyal gelişim için p=0.007, dil gelişimi için p <0.001). Preterm çocuklarda CAPES-TR duygusal ve davranışsal sorunlar ölçek puanları daha yüksekti. CAPES-TR Ebeveyn Özyeterliliği puan ortalaması preterm çocuklarda daha düşüktü (p=0.000). ABSÖ-KF toplam puanı ile ASBÖ-KF izin verici anne babalık alt ölçek puanı preterm çocuk annelerinde daha yüksekti (p =0.005 ve p<0.001). Dil Bozukluğu ve genel gelişimsel gecikme tanısı konma oranları preterm çocuklarda daha yüksekti (sırasıyla p=0.006 ve p=0.019). Doğum haftası, anne eğitim düzeyi ve aylık gelir düzeyi ile TEDİL skorları, DENVER kişisel sosyal ve dil gelişim düzeyi arasında pozitif korelasyon saptandı (p<0.050).

Sonuç: Çalışmamız preterm çocuklarda erken dönemde yakın takip ve gerekli olduğunda özel eğitim desteği planlamasının önemli olduğunu göstermektedir.

Anahtar Sözcükler: Davranış sorunları, Dil gelişimi, Anne baba tutumu, Ebeveynlik stresi, Prematüre

INTRODUCTION

Long-term results show that preterm babies are at the risk for neurodevelopmental problems and psychiatric disorders. In literature, retardation in fine and gross motor skills, speech delay, difficulties in learning, problems in social and emotional life, hyperactivity, attention deficit, and behavioral problems are often reported as problems that preterm-born children may face (1). In a meta-analysis examining the frequency of anxiety and depressive disorders in children born preterm, it was found that preterm birth was associated with higher levels of anxiety disorder in the period from 3 to 19 years of age (2). In another meta-analysis, low gestational age, low birth weight, neonatal morbidities, and low maternal education levels were associated with lower intelligence scores in young adulthood (3).

The increase in the quality and number of intensive care units has led to an increase in the survival rates of preterm babies. The increase in survival rates has brought the problems of care of preterm babies, who are at high risk in terms of neurodevelopmental, gastrointestinal and respiratory problems. It has been reported that mothers, one of the most important elements of this care, may experience more stress, financial difficulties, and relationship difficulties than those who give birth at term (4). Being more anxious than other parents may cause parents of preterm children to display a more controlling style of parenting (5,6). The high levels of stress in mothers of preterm babies and using control strategies may lead to decreased interactive play with their child and deterioration in the self-regulation capacity of the child. As a result, it has been reported that difficulties in social areas, internalization and externalization problems may appear in the child (7-9).

One of the hypotheses of the study is that there is retardation in language development and general development is more common in preterm-born children during the preschool period compared to term-born children, and also there is a higher rate of emotional and behavioral problems in preterm-born children. Besides, it was assumed that the stress level of caregivers of preterm-born children is higher, parental self-efficacy is lower, and education level and socioeconomic level are factors associated with these risks. It is important to carry out the regular follow-up of children born preterm in the early period and to identify problems in developmental and behavioral areas.The impacts of preterm birth on the child and family can be reduced by identifying the children in need and ensuring that they benefit from the support systems such as special education in the early period. Although follow-up studies on children preterm-born are common in the literature, these children are compared with term children.There are limited studies, that compare general development and language development in the pre-school period, and also the mental health, attitude characteristics and stress levels of the parents, who have the greatest impact on the development of the children, especially in the pre-school period. The aim of our study is to investigate the neurodevelopmental, emotional and behavioral problems, parental attitudes, parental stress levels and related factors in pre-school period in preterm and term-born children who were hospitalized in the neonatal intensive care unit.

MATERIALS and METHODS

Our study was conducted with 176 pre-school children, at least 30 months old during the study and their mothers, who were born preterm and term and were hospitalized between 2017 and 2019 in the secondary neonatal intensive care unit of a regional pediatric hospital during the neonatal period. Ninety children were born prematurely and 86 children were born at term. The parents were reached through the contact information in the hospital records. The number of preterm children who met the

inclusion criteria and could be reached via registered phone numbers was 117, and the number of term children was 122. Twenty-seven of the parents of preterm children and 36 of the parents of term children were excluded from the study because they did not agree to participate in the study or did not attend the scheduled appointment. Parents who agreed to participate in the study were given an appointment to be evaluated in the child and adolescent psychiatry outpatient clinic.

For both preterm and term-born children, being at least 30 months old at the time of the study, treatment with hospitalization in the neonatal intensive care unit of our hospital during the newborn period for both groups, their parents agreeing to participate in the study, and being literate at a level to fill the assessment tools were accepted as inclusion criteria. When evaluating the results of the study, in order to avoid bias, children who were born both preterm and term were excluded from the study, who are known to have a significant risk factor that affect general development and language development, and who have severe congenital, genetic diseases that have high risk of affecting the stress level of parents, or children who were reported to have severe neurological sequelae. Besides, parents who did not agree to participate in the study and were illiterate to understand and fill in the scales were not included in the study.

Mothers completed the sociodemographic data form, Child Adjustment and Parent Efficacy Scale (CAPES-TR), Parenting Stress Index-Short Form (PSI-SF), and Parenting Styles and Dimensions Questionnaire – Short Version (PSDQ). Denver II Developmental Screening Test (DDST) was applied to all children by an experienced child development specialist, and the Test of Early Language Development - Third Edition (TELD-3) was applied by a speech and language therapist. All children born preterm and term were evaluated by a child and adolescent psychiatry specialist in the child and adolescent psychiatry outpatient clinic. In the diagnostic evaluation of children, TELD-3 and DDST results were examined, and a psychiatric interview based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was peformed.

Ethics committee approval was obtained from Uludag University with the date 26.05.2021 and number 2021-6/8.

Evaluation tools

Sociodemographic data form

In this form, there are questions to investigate the birth week of children, hospitalization history, pregnancy background of mothers, education level and economic condition of parents, and family structure.

Child Adjustment and Parent Efficacy Scale (CAPES-TR)

The scale consists of 27 items and is filled by the parents.The child adjustment subscale consists of two factors: behavioral problems and emotional problems.The other subscale of CAPES-TR is the parent efficacy subscale. Higher scores in the child adjustment subscale indicate an increase in problematic behaviors related to child adjustment. An increase in the scores in the parent efficacy subscale means that parents have got high self-efficacy in coping with behaviours of their child (10).

Parenting Styles and Dimensions Questionnaire – Short Version (PSDQ)

It was developed to evaluate parenting attitudes. It is filled by the mothers or fathers. The scale includes three subscales that measure democratic, authoritarian, and permissive parenting attitudes. Each subscale is evaluated within itself. The total score obtained from the items which form the subscales includes information about that attitude (11).

Parenting Stress Index-Short Form (PSI-SF)

The scale consists of parental stress, unsuccessful parent-child interaction and difficult child sub-dimensions. A high score on a sub-dimension indicates that parents are experiencing stress on that sub-dimension. An increase in the total scale score means an increase in the stress level of the parents (12).

Denver Developmental Screening Test (DDST)

It provides data on personal-social development, fine motor development, language development and gross motor development of children aged 0-6. It is also a test that helps clinical interviews to detect developmental problems and monitor development (13).

Test of Early Language Development - Third Edition (TELD-3)

It was developed to measure the language skills of children between 2 years 0 months and 7 years 11 months. It is used for purposes such as diagnosing children with language disorders in the early period and providing information about the developmental process(14).

Statistical analysis:

Data were uploaded to and analyzed using SPSS version 23.0 (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY). Data obtained by measurement are shown as arithmetic mean ± standard deviation, and data obtained by counting as a percentage (%). Kolmogorov Smirnov test was used to evaluate the fit of numerical variables to normal distribution. Categorical variables such as DDST,socio-demographic variables such as child gender, educational status of parents, employment status of parents, monthly income level and diagnoses made with evaluation based on DSM–5 in preterm and term children were compared with Chi-square analysis and Fisher's Exact Test. Child age, mean age of mother, mean age of father, TELD-3, CAPES-TR, PSI-SF and PSDQ scores in children born preterm and term were compared with the Mann-Whitney U test because the data were not normally distributed. Spearman correlation analysis was used for non-normally distributed data while comparing the relationships between birth week of children, income level of family, education level of mother, CAPES-TR,

PSI Short form, DDST and TELD-3. Statistical significance was accepted as p<0.050 at the 95% confidence interval.

RESULTS

The mean age of the preterm children when they were included in the study was 37.97±3.62 months, and the mean age of the term children was 38.77±3.28 months. The age range of both preterm and full term children ranged from 33 to 46 months. Regarding gender, 58.9% (n=53) of preterm children and 58.1% (n=50) of term children were male. There was no significant difference between the two groups for the mean age and gender ratios of the children (p=0.087 and p=0.920, respectively). The mean birth week was 32.96 weeks (minimum 25-maximum 36 weeks) in preterm children, and 38.79 weeks (minimum 37-maximum 42 weeks) in term children. The hospital stay was 19.45±14.55 days in preterm children and 7.09±4.75 days in term children. Preterm children had a significantly longer hospital stay (p<0.001). Birth weight was found to be 1981.22 grams (±611.20) in preterm children and 3420 grams (±482.09) in term children. Birth weight was significantly lower in preterm children (p<0.001). Again, 77.8% (n:70) of the children born preterm were delivered by cesarean section, while the rate of delivery by cesarean section was found to be 58.1% (n:50) in term babies. Cesarean section rate was significantly higher in preterm children (p=0.005) (Table I). When the reasons for hospitalization in the neonatal period were examined, 54.4% (n:49) of the preterm children had respiratory distress syndrome, 40% (n:36) had transient tachypnea of the newborn, 2.2% (n:2) had congenital pneumonia, 2.2% (n:2) had indirect hyperbilirubinemia and 1.1% (n:1) due to early neonatal sepsis.

Table I: Sociodemographic Characteristics.

	Preterm n (%)	Term n (%)	p
Child Age (Month±SD)	37.97 (±3.62)	38.77 (±3.28)	0.087*
Birth week	32.96 (±2.40)	38.79 (±0.99)	0.000*
Birth weight (grams)	1981.22 (±611.20)	3420.34 (±482.09)	0.000*
Birth method			
Normal	20 (22.2)	36 (41.9)	0.005†
Cesarean	70 (77.8)	50 (58.1)	
Duration of hospital stay	19.45 (±14.55)	7.09 (±4.75)	0.000*
Child Gender			
Girl	37 (41.1)	36 (41.9)	0.920†
Boy	53 (58.9)	50 (58.1)	
Mean age of mother (year±sd)	32.03 (±5.96)	31.96 (±4.95)	0.956*
Mean age of father (year±sd)	36.94 (±6.75)	35.58 (±5.34)	0.212*
Educational Status of Mother			
Secondary School and below	61 (67.8)	41 (47.7)	0.007†
High School and above	29 (32.2)	45 (52.3)	
Educational Status of Father			
Secondary School and below	50 (55.6)	33 (38.4)	0.022†
High School and above	40 (44.4)	53 (61.6)	
Emloyment Status of Mother			
Works	11 (12.2)	22 (25.6)	0.023†
Does not work	79 (87.8)	64 (74.4)	
Employment Status of Father			
Works	82 (91.1)	81 (94.2)	0.436†
Does not work	8 (8.9)	5 (5.8)	
Monthly income level			
Minimum wage and below	43 (47.8)	24 (27.9)	0.007†
More than minimum wage	47 (52.2)	62 (72.1)	
Any siblings			
Yes	78 (86.7)	69 (80.2)	0.250†
No	12 (13.3)	17 (19.8)	
Who gives care for the child?			
Mother	86 (95.6)	76 (88.4)	0.078†
Baby-sitter or family elder	4 (4.4)	10 (11.6)	
What is the family structure like?			
Nuclear family	69 (76.7)	70 †(81.4)	0.442†
Extended family	21 (23.3)	16 (18.6)	

**:Mann Whitney U Test, †: Chi Square Tests,*

Table II: Comparison of DDST and TELD-3 results in children born preterm and term.

	Preterm	Term	p
DDST personal social development*			
normal	71 (78.9)	80 (93.0)	0.007‡
abnormal	19 (21.1)	6 (7.0)	
DDST language development*			
normal	60 (66.7)	79 (91.9)	0.000‡
abnormal	30(33.3)	7 (8.1)	
DDST fine motor development*			
normal	86 (95.6)	84 (97.7)	0.683§
abnormal	4 (4.4)	2 (2.3)	
DDST gross motor development*			
normal	83 (92.2)	85 (98.8)	
abnormal	7 (7.8)	1 (1.2)	0.065§
TELD-3 Receptive Language†	31.45 (±8.41)	37.51(±4.84)	0.000‖
TELD-3 Expressive Language†	28.27 (±7.83)	35.72 (±5.57)	0.000‖

***:**n(%), **†:**Mean ±SD, **‡:**Pearson Chi-Square Test, **§:**Fisher's Exact Test, **‖:**Mann Whitney U Test, **DDST:** Denver Developmental Screening Test, **TELD-3:** Test of Early Language Development-Third Edition*

When hospitalization indications of children born at term were examined, 44.2% (n: 38) had indirect hyperbilirubinemia, 23.3% (n: 20) had early neonatal sepsis, 16.3% (n: 14) had transient tachypnea of the newborn, and 16.3% (n: 14) had congenital pneumonia.

The mean age of the mothers was 32.03±5.96 years in preterm children, 31.96 ±4.95 years in term children.The mean age of the fathers was 36.94±6.75 years in preterm children, 35.58±5.34 years in term children. No significant difference was found between the two groups in the comparison made for the mean age of the mother and father (p-value mean age of mother p=0.956; for father p=0.212). Rates of having a secondary school or lower education level were significantly higher for both mothers and fathers in preterm children than term children (the was p=0.007 for mothers and p=0.022 for fathers). The rate of having a minimum wage or lower income level in the families of preterm children was significantly higher (p=0.007) (Table I).

According to the TELD-3 results, subtest scores evaluating both receptive and expressive language development in preterm children were significantly lower than in term children (p <0.001 for both receptive and expressive language skills). According to DDST results, the rate of children with abnormal development in preterm children regarding the personal social development was 21.1% (n:19), while this rate was 7.0% (n:6) in term children. Also, the rate of children with abnormal development in preterm children regarding the language development was 33.3% (n:30), while this rate was 8.1% (n:7) in term children. The rates of children with abnormal development regarding personal social development and language development were significantly higher in preterm children (p=0.007 for personal social development and p<0.001 for language development, respectively). Besides, according to DDST results, although rates of abnormal development were higher in preterm children in fine motor and gross motor development than in term children, these differences were not statistically significant (p=0.683 for fine motor development, p<0.065 for gross motor development) (Table II).

Preterm and term children were compared according to the scores obtained from the CAPES-TR subscales filled by the mothers. CAPES-TR emotional problems (p=0.015), behavioral problems (p=0.009), and child adjustment subscale total score (p=0.005) were higher in preterm children (Table III). Comparisons were made for parenting self-efficacy, parenting stress, and parenting attitudes of the mothers. The mean score of the Parental Self-Efficacy Sub-Scale, which is included in the CAPES-TR scale and evaluates the self-confidence of the parents, was lower in mothers of preterm children (p<0.001). The mean PSI-SF Total Score, which evaluates the stress level of parents in child care, was higher in mothers of preterm children (p=0.005). There was no significant difference between the groups in the mean scores of the PSDQ democratic and authoritarian parenting subscales (p=0.159 and 0.408, respectively). The mean score of the permissive parenting subscale was higher in preterm children (p<0.001) (Table III).

A psychiatric interview based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was done for the psychiatric diagnostic evaluation of the children. A total of 26.7% (n:24) of preterm children were diagnosed with language disorder, while the rate of children diagnosed with language disorder in term children was 10.5% (n:9). The rate of diagnosis of global developmental delay was 18.9% (n:17) in preterm children, while it was 7.0% (n:6) in term children.The rates of having language disorder and global developmental delay diagnosis were higher in preterm children (p=0.006 for language disorder, p=0.019 for global developmental delay). Furthermore, while two children were diagnosed with ASD in the preterm group, no child was diagnosed with ASD in the term group. ASD was defined in a limited number of patients, thus, no statistical comparison was made between the two groups.

We also examined the relationship between CAPES-TR, PSI-SF, scores of TELD-3 and DDST subtests. There was a negative correlation between the difficulty score of CAPES-TR Child Adjustment subscale and TELD-3 receptive (r=-0.171, p=0.023) and expressive language (r=-0.232, p=0.002), DDST personal social (r=-0.252, p=0.001), language (r=-0.210, p=0.005), and fine motor development levels (r=-0.170, p=0.024). There was a positive correlation between the mean score of CAPES-TR Parental Self-Efficacy Sub-Scale and TELD-3 receptive (r=0.226, p=0.003) and expressive language

Table III: Comparison of CAPES-TR, PSI-SF, PSDQ scores in preterm and term children.

	Preterm	Term	p†
CAPES_TR Child Adjustment Subscale Emotional Problems*	3.00 (±2.53)	1.98 (±1.58)	0.015
CAPES_TR Child Adjustment Subscale Behavioral Problems*	27.65 (±11.51)	22.63 (±10.05)	0.009
CAPES_TR Child Adjustment Subscale Total Score*	30.65 (±13.12)	24.62 (10.99)	0.005
CAPES_TR Parental Self-Efficacy Subscale*	135.17 (±31.96)	160.33 (±20.30)	0.000
PSDQ democratic parenting attitude*	60.56 (±8.88)	62.82 (±7.15)	0.159
PSDQ authoritarian parenting attitude*	19.05 (±5.18)	18.62 (±5.28)	0.408
PSDQ permissive parenting attitude*	13.92 (±3.84)	11.27 (±3.50)	0.000
Parenting Stress Index-Short Form Total Score*	78.31 (±23.54)	68.18 (±18.02)	0.005

***:**Mean±SD, **†:**Mann Whitney U Test, **CAPES_TR:** Child Adjustment and Parent Efficacy Scale, **PSDQ:** Parenting Styles and Dimensions Questionnaire–Short Version*

Table IV: Correlations between birth week of children, income level of family, education level of mother, CAPES-TR, PSI Short form, DDST and TELD-3.

	1	2	3	4	5	6	7	8
1. CAPES_TR Child Adjustment Total Score								
2. CAPES_TR Parental Self-Efficacy Subscale	-0.666 *							
3. PSI Short Form Total Score	0.663*	-0.587*						
4. TELD-3 Receptive language	-0.171 (p=0.023)	0.226 (p=0.003)	-0.192 (p=0.011)					
5. TELD-3 Expressive Language	-0.232 (p=0.002)	0.229 (p=0.002)	-0.228 (p=0.002)	0.893*				
6. DDST personal social development	-0.252 (p=0.001)	0.227 (p=0.002)	-0.169 (p=0.025)	0.613*	0.607*			
7. DDST language development	-0.210 (p=0.005)	0.247 (p=0.001)	-0.189 (p=0.012)	0.876*	0.929*	0.655*		
8. DDST Fine Motor development	-0.170 (p=0.024)	0.221 (p=0.003)	-0.155 (p=0.041)	0.514*	0.452*	0.808*	0.552*	
9. Birth week	-194 (p=0.010)	0.357*	-155 (p=0.040)	0.369*	0.423*	0.178 (p=0.018)	0.468*	0.174 (p=0.021)
10. Montly income level	-0.259 (p=0.001)	0.274 *	-0.212 (p=0.005)	0.227 (p=0.002)	0.316*	0.203 (p=0.007)	0.291*	0.127 (p=0.094)
11. Education level of mother	-0.196 (p=0.009)	0.237 (p=0.002)	-0.216 (p=0.004)	0.190 (p=0.011)	0.209 (p=0.005)	0.159 (p=0.035)	0.194 (p=0.010)	0.008 (p=0.918)

*Spearman's correlation analysis, *****p<0.001 statistically significant, **CAPES_TR:** Child Adjustment and Parent Efficacy Scale, **PSDQ:** Parenting Styles and Dimensions Questionnaire–Short Version, **DDST:** Denver Developmental Screening Test, **TELD-3:** Test of Early Language Development - Third Edition*

(r=0.229, p=0.002), DDST personal social (r=0.227, p=0.002), language (r=0.247, p=0.001), and fine motor development levels (r=0.221, p=0,003). A negative correlation was found between PSI-SF and TELD-3 receptive (r=-0.192, p=0.011) and expressive language scores (r=-0.228, p=0.002) and DDST personal social (r=-0.169, p=0.025), language (r=-0.189, p=0.012), and fine motor development level (r=-0.155, p=0.041) (Table IV).

A positive correlation was determined between birth week, education level of mother, and monthly income level of family and CAPES-TR Parental Self-efficacy, TELD-3 receptive and expressive language scores, DDST personal social and language development level of all children. A negative correlation was found between birth week, education level of the mother, monthly income of the family, and CAPES-TR Child Adjustment Total Difficulty score and PSI-SF total score (p<0.050) (Table IV).

In our study, preterm children were also divided into two groups as early preterm (gestational age less than 32 weeks) and, moderate and late preterm (gestational age between 32 and 37 weeks). The statistical analysis were performed for the groups separately. Between these two groups, there was no significant difference in the comparisons made in terms of maternal education levels and monthly income levels (p=0.218 for maternal education level, p=0.737 for monthly income level). According to the DDST results, there was no statistically significant difference between the early preterm and, modarate/late preterm children in terms of personal social development, fine motor development and language development (p values for personal social development p=0.604, fine motor development p=0.292, language development p=1.000). Also according to the TELD-3 results, there was no statistically significant difference between groups (p-value for receptive

Table V: Comparisons made for children born early preterm and moderate or late preterm.

	Early Preterm	Moderate or Late Preterm	p
Educational Status of Mother*			
Secondary School and below	25 (75.8)	36 (63.2)	0.218‡
High School and above	8 (24.2)	21 (36.8)	
Monthly income level*			
Minimum wage and below	15 (45.5)	28 (49.1)	0.737‡
More than minimum wage	18 (54.5)	29 (50.9)	
DDST personal social development*			
normal	27 (81.8)	44 (77.2)	0.604‡
abnormal	6 (18.2)	13 (22.8)	
DDST language development*			
normal	22 (66.7)	38 (66.7)	1.000‡
abnormal	11 (33.3)	19 (33.3)	
DDST fine motor development*			
normal	33 (100)	53 (93.0)	0.292§
abnormal	0 (0)	4 (7.0)	
CAPES_TR Child Adjustment Subscale Total Score†	31.54 (±13.21)	30.14 (±13.16)	0.503‖
CAPES_TR Parental Self-Efficacy Subscale†	131.60 (±33.82)	137.24 (±30.95)	0.456‖
Parenting Stress Index-Short Form Total Score†	76.66 (±21.03)	79.26 (±25.01)	0.706‖
TELD-3 Receptive Language†	31.87 (±8.59)	31.21 (±8.37)	0.807‖
TELD-3 Expressive Language†	28.84 (±7.18)	27.94 (±8.24)	0.613‖

***:** *n (%),* **†:** *Mean ±SD,* **‡:** *Chi Square Tests,* **§:** *Fisher's Exact Test,* **‖:** *Mann Whitney U Test*

language: p=0.807, expressive language: p=0.613). In addition, no significant difference was found in terms of the CAPES-TR child adjustment subscale total score (p=0.503), the CAPES-TR parental self-efficacy subscale mean score (p=0.456) and the PSI-SF total mean score (p=0.706) were compared with early preterm and moderate/late preterm children (Table V).

DISCUSSION

Despite the improvements in neonatal intensive care units, infants and children born preterm are still likely to experience delays in cognitive, language, and motor development. In our study, in which we evaluated preterm and term children who were hospitalized in the neonatal intensive care unit, we had important findings such as language development and general development retardation, more emotional and behavioral problems, higher rate of diagnosis of neurodevelopmental disorder, decrease in parenting self-efficacy and increase in the level of parental stress in preterm children.

In our study, TELD-3 receptive language and expressive language scores were lower in preterm children and the rate of children with abnormal development in the areas of personal social development and language development from DDST subtests was higher in preterm children. As a result of DSM-5 based psychiatric interviews, both language disorder and global developmental delay diagnoses were higher in preterm children. In a review of studies evaluating language development in children with prematurity and low birth weight, retardation in both receptive and expressive language development of children was found in four of 11 studies (15). In another study comparing neurodevelopmental problems, mental index scores and psychomotor index scores were found to be lower in preterm children (1). Literature and our study results show that preterm children are at risk of retardation in many areas of development.

In our study, CAPES-TR emotional problems, behavioral problems, and child adjustment subscale scores were higher in preterm children. In a study conducted in the Netherlands, more attention and behavior problems, retardation in cognitive development, and emotional regulation difficulties were determined in children born between 32nd-36th weeks compared to term children (16). In the same study based on the reports of both mothers and teachers, more attention problems and hyperactivity were reported in middle/late preterm children when they were 8 years old compared to term children (16). In a review in which 28 studies were examined, it was reported that psychiatric disorders, especially ADHD, were more common in preterm children, but there were inconsistent findings regarding the frequency of ASD (17). Considering the prevalence of emotional and behavioral problems in premature children, especially the evaluation of neurodevelopmental disorders and the arrangement of appropriate treatments in the early period may increase the capacity of these children to adapt to school against the risk of lowering their school success.

In our study, the mean score of the Parental Self-Efficacy Subscale was lower in mothers of preterm children. Preterm infants behave less reactive in parent-infant interactions. Moreover, they are observed as less rewarding social partners

in reciprocal relationships. Therefore, parents of preterm infants may experience difficulties in acquiring a sense of self-efficacy regarding parenting tasks more commonly (18). In addition, the mean PSI-SF Total Score was higher in the mothers of preterm children. Studies have reported higher levels of post-traumatic stress disorder, anxiety, and depression in the first 6 months, 5th and 7th years after birth in parents who gave preterm birth (19,20). Considering our findings and the literature, it can be commented that preterm birth carries risks not only for the child but also for the mental health of the parents and the quality of parenting. Therefore, while planning the intervention programs, the needs of the parent should be taken into account as well as the preterm child.

There was no significant difference in the mean scores of democratic and authoritarian parenting subscales, while the mean score of permissive parenting was higher in preterm children. Premature birth can cause stress for parents. It has been reported that having such a child negatively affects parenting behavior and the development of the child (21). In a meta-analysis, parents with preterm children were found to be more controlling than those with full-term births. Also, studies were reporting that mothers of preterm babies may start to behave less controlling after the first 6 months of life (22). In another meta-analysis, no difference was found in terms of attitude towards children (23). Compared with other studies, the different results regarding parental attitudes in our study can be explained by the heterogeneity of samples related to characteristics such as gestational age, birth weight, the age range of children, and socioeconomic status, compared to other studies.

Another finding of our study is that there is a negative correlation between CAPES-TR Child Adjustment total difficulty score and TELD-3 receptive and expressive language, DDST personal social, language, and fine motor development levels. In a study conducted with 386 preschool children, a negative correlation was found between language skills and behavioural problems (24). On the other hand, a positive correlation was reported between language skills and social skills. In a study examining the relationship between self-regulation skills and language development from the pre-school period to the second grade, it was reported that children who showed self-regulation skills in the early stages had better language and reading comprehension skills in the forthcoming periods (25). Considering their interrelationships, it is important to provide appropriate guidance for the solution of emotional and behavioral problems that may adversely affect their benefit from education, while planning education for developmental problems in preterm children.

There was a positive correlation between the mean score of the CAPES-TR Parental Self-Efficacy Subscale and the TELD-3 and DDST subtests (except for gross motor development). Besides,there was a negative correlation between PSI-SF Total Score and TELD-3 and DDST subtests (except for gross motor development). The effects of the mother's stress and self-efficacy on language development can be explained by the fact that the interaction between mother and child is not good enough. In studies, delays in the language development of the child have been reported in cases in which the mother is less sensitive to the child (26). It has been reported that children of depressed mothers have fewer number of words at the age of 1-3 years compared to children of non-depressed mothers (27). It is important to evaluate the relationship with the mother in detail, especially while planning education for children with retardation in global and language development. In the presence of insufficient and inappropriate mother-child relationships, making the necessary arrangements will increase the benefit of special education.

In our study, the education level of the mother and the monthly income level of the family were lower in preterm children. Also a positive correlation was found between the birth week, education level of the mother, monthly income level of the family, TELD-3 receptive and expressive language scores, DDST personal social and language development level. Also, a negative correlation was found with the CAPES-TR Child Adjustment Total Difficulty Score. In a study in which 101 preterm and 44 term children at an average age of 12.5 years were evaluated, it was shown that low socioeconomic levels have a negative effect on the cognitive development of preterm adolescents (28). In another study investigating the effect of socioeconomic differences on the language development of premature children, language scores of premature children who were at a low socioeconomic level were found to be lower than those with a high socioeconomic level when they reached the age of 2 (29). In a study investigating the effect of mothers'education level on language, cognitive, and motor skills of 177 children who were born preterm, the Bayley Infant Development Scale was used at the corrected age of 20 months. The study found that as the education level of the mother increased, preterm babies got higher scores (30). Having a low socioeconomic level increases these risks even more for the preterm babies born with many risks. In this context, the necessity of supporting families with low socioeconomic levels who have preterm babies comes into sight.

In our study, no significant difference was found in comparisons made for socioeconomic factors, DDST, TELD-3 and CAPES-TR for children born early preterm and moderate and late preterm. In another study comparing the neurodevelopmental prognosis of late preterm children with early preterm children in the preschool period, no significant difference was found between the two groups in terms of personal social development and gross motor development. In the same study, it was reported that the mean scores of both groups were similar in terms of socioeconomic and cultural level scoring (31). The fact that no significant differences were found in the comparisons between children born early and late preterm in our study suggests that the family structure is mostly similar, and that parents at all levels continue to support their children.

Limitations:

In our study, focusing only on mother-child interactions rather than evaluating father-child interactions is among the limitations. Again, the fact that the study was single-centered can be considered as another limitation. In the future, multicenter studies that also evaluate father-child interaction will contribute to the literature.

CONCLUSION

Early evaluation of children born preterm, who are at risk of having problems in many developmental areas, can be helpful for interferences such as special education support. Early education support for those in need can reduce the difficulties they may experience during the school period. Our findings prove that the difficulties experienced in many areas by preterm children are also closely related to socioeconomic factors. Therefore, in addition to the special education support which will be planned for preterm children, it is also important to include initiatives for the social environment, especially parental education, into the process.

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