Comparison of Cognitive and Behavioural Problems and Psychiatric Diagnoses in Preterm Born Children between 6-13 Years Old

Rahime Hülya Bingöl Çağlayan a,*, Burcu Gökalp Ozcan b, Mine Elağöz Yükse c, Irem Hamamçioğlu Yanardoner d, Veysi Çeri e, Merve Minkari Tunçay f, Fatma Çöksesen Pamukcu g, Güneş Özen Urcan h, Tuğba Erer Erçan h, Burak Doğangün a

a İstanbul University-Cerrahpasa, Cerrahpasa School of Medicine, Child and Adolescent Psychiatry Clinic, Istanbul, Turkey
b Sanko University Hospital, Child and Adolescent Psychiatry, Istanbul, Turkey
c Üsküdar University School of Medicine, Child and Adolescent Psychiatry, Istanbul, Turkey
d Oxford Health NHS Foundation Trust, Istanbul, Turkey
e Batman University, Child development, Batman, Turkey
f İzmir Ekonomi Üniversitesi, Administrative İzmir Turkey
g Free-Lance psychologist, Istanbul, Turkey
h Maltepe University School of Medicine Neonatology Department, Istanbul, Turkey

ARTICLE INFO

Article history:
Received 29 January 2022
Received in revised form 20 February 2022
Accepted 30 April 2022

Keywords:
Preterm
Cognitive functions
WISC-R Scores

ABSTRACT

Introduction: Despite the increased survival rates follow up studies of preterm born children have documented increased prevalence of neurodevelopmental disabilities and cognitive deficits. By using psychiatric assessment, we aimed to evaluate cognitive functions by comparing preterm born babies according to the week of gestation by comparing the scores of the Wechsler Intelligence Scale for Children-Revised Form (WISC-R) in childhood.

Material and methods: Children with a history of birth as preterm babies between 1998-2004 were included in the study. The children born between 27-36 weeks, currently 6-13 years old were admitted to the study. The controls consisted of healthy children chosen from the nearest primary school. The WISC-R test was administered to all children. Classification was made according to gestational age. The comparison of cognitive functions was performed by comparing the WISC-R scores of the preterm group and the control group.

Results: 238 children were included in our prospective study. (case group: 175 children, control group: 63 children). Because of the comparison of the WISC-R scores of the preterm and control groups, the WISC-R verbal score and WISC-R total score were found to be statistically significant between the preterm and control groups. In the analysis made according to the gestation age, no statistical significance was found between the WISC-R Verbal, WISC-R performance, and WISC-R total scores according to the week of gestation. No statistically significant difference was found in terms of previous and current psychiatric diagnoses.

Conclusions: While the WISC-R score was, found to be statistically significantly higher in the case group compared to controls. Our results differed from those in the literature that preterm children had a lower WISC-R score and it indicates the need to investigate this situation by further studies, even by different tests.

© 2022 The Authors. Published by Iberoamerican Journal of Medicine. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).
**1. INTRODUCTION**

Despite a higher survival rate, 50% of preterm low birth weight (LBW) babies in particular are reported to have developmental problems at later ages, including motor, cognitive, and behavioural disorders [1]. Brain damage that may occur in preterm children and its impact on neurodevelopment is assessed by classifying this patient population into specific subgroups. There are two accepted valid classifications. These:

A. Classification by gestational age:
   a. Extremely preterm (24-31 weeks, babies born before 32 weeks).
   b. Moderately preterm (babies born between 32 and 35 weeks).
   c. Borderline preterm (babies born at 36-37 weeks [1-3].

B. Classification by birth weight:
   a. Low birth weight (LBW) preterm: born between 1500- < 2500 grams.
   b. Very low birth weight (VLBW) preterm (VLBW): born between 1000- < 1500 grams.
   c. Extremely low birth weight (ELBW) preterm (ELBPW): born below < 1000 grams [1-3].

According to the United States of America data, preterm births account for 1-5% of all live births, and this rate is increasing day by day [4]. Because preterm babies are born at a critical time when their brain structure is not fully developed, 25-50% of these babies have psychiatric problems, including neurodevelopmental disorders, socialization problems, and attention deficits [5-7]. Our aim was to evaluate the cognitive functions of preterm children according to the week of gestation by comparing the scores of the Wechsler Intelligence Scale for Children-Enhanced Form (WISC-R) in childhood with this study.

**2. MATERIAL AND METHODS**

This prospective study was conducted in 2011 between May 2011 and September 2011 at Istanbul University-Cerrahpasa, Cerrahpasa school of Medicine Department of Pediatrics. The ethical Committee approval was obtained from the local ethics committee for the conduct of the study (based on Resolution No. 16405 of the Ethics Committee of...
the Medical Faculty of our university dated May 9, 2011). The study included children with a history of preterm birth who were hospitalized in the neonatal intensive care unit (NICU) of the center of the study between 1998 and 2004 because of intraventricular hemorrhage, patent ductus arteriom (PDA), bronchopulmonary dysplasia, fetal hydrothorax, necrotising enterocolitis, meconium aspiration and diaphragm hernia. The eligibility criteria for the research were birth between 27-36 weeks and age 6-13 years.

The parents were reached by telephone. Parents were informed of the procedures associated with the study, and the children of parents who agreed to these conditions were included as 'volunteers' in the research sample. After this interview, families were asked to complete a demographic data form. Families were informed of the results of the applied tests after the calculations had been performed.

The children of the families who met the inclusion criteria and agreed to participate voluntarily formed the case group. One hundred seventy-five children were included in the study.

The control group was consisted of children of the same age and sex with the case group chosen from a local primary school. They were reported as term children, and their families gave a written consent to participate in the study.

The inclusion criteria for the control group was to be born preterm and not received any psychiatric treatment. One hundred seven-five children were included in the study.

The only inclusion criteria for the control group was to be born preterm and have become the diagnosis of any psychiatric disorders detected and the events and morbidities that occurred during the prenatal and postnatal process (such as preeclampsia, multiple pregnancy, use of assisted reproductive techniques, intraventricular hemorrhage, sepsis, necrotisan enterocolitis).

2.2. SCHEDULE FOR AFFECTIVE DISORDERS AND SCHIZOPHRENIA FOR SCHOOL-AGE CHILDREN PRESENT AND LIFETIME VERSION (K-SADS-PL)

This semi-structured interview was administered to all adolescents and their parents by a child and adolescent psychiatrist to determine depressive and anxiety disorders and comorbid psychiatric disorder in the control group. K-SADS-PL is a valid and reliable instrument for Turkish children and adolescents.

2.3. CHILD BEHAVIOR CHECKLIST FOR AGES 6-48 YEARS (CBCL 6-18)

This parent-rated CBCL provided information on the index subject’s behaviors in the past 6 months (0–2) grouped under subscales. The reliability and validity of the Turkish version of CBCL 6-18 is well established.

2.4. EXPECTED OUTCOMES

1. To determine the frequency of behavioural and psychopathological problems in preterm and low birth weight children followed up in our Intensive Care Unit (ICU),
2. To evaluate cognitive functions,
3. To determine a possible association between the psychiatric disorders detected and the events and morbidities that occurred during the prenatal and postnatal process (such as preeclampsia, multiple pregnancy, use of assisted reproductive techniques, intraventricular hemorrhage, sepsis, necrotisan enterocolitis).
2.5. STATISTICAL ANALYSIS

The collected data were analysed using SPSS 21.0 software. Numbers, percentages, and averages were given in the list of data, and data were analysed using the Mann-Whitney U test and chi-square tests when appropriate. The Shapiro-Wilk test was used for normality tests and it was observed that the normality assumption was met. Independent samples t-test was used to detect differences between groups, and Pearson correlation tests were used for correlation between continuous variables. A p-value of < 0.05 was considered statistically significant at the statistical significance level.

3. RESULTS

Two hundred thirty-eight children were enrolled in the study. One hundred seventy-five children (54.9% male) formed the case group and 63 children formed the control group. When the case group was examined by gestational age, 36.6% were born at less than 31 weeks (extremely preterm), 32% were born between 32 and 35 weeks (moderately preterm), 22.9% were born between 36 and 37 weeks (borderline preterm), and 8.6% were preterm and born at an unknown week. All in the control group were born at term (Table 1). The problems preterm babies face in the neonatal period are summarized in Table 2. Rates of mechanical ventilation, steroid use, and surfactant use were statistically higher in preterm babies ≥32 weeks and above.

### Table 1: Comparison of case and control groups by week of gestation and gender

| Variable                  | Case group (n=175) (%) | Control group (n=63) (%) |
|---------------------------|------------------------|--------------------------|
| Gender                    |                        |                          |
| Male                      | 96 (54.9)              | 29 (46)                  |
| Female                    | 79 (45.1)              | 34 (54)                  |
| Week of gestation         |                        |                          |
| ≤31 weeks                 | 64 (36.6)              | 0 (0)                    |
| ≥32 weeks                 | 96 (54.9)              | 0 (0)                    |
| Unknown                   | 15 (8.6)               | 0 (0)                    |
| >37 weeks                 | 0 (0)                  | 63 (100)                 |

### Table 2: Monitored problems in preterm

| Variable                  | Gestational age ≤31 weeks n=64 (%) | Gestational age ≥32 weeks n=111 (%) | p value |
|---------------------------|----------------------------------|-----------------------------------|---------|
| Delivery method           |                                  |                                   | 1.388   |
| Caesarean                 | 046 (71.9%)                      | 89 (80.2%)                        |         |
| Normal vaginal delivery   | 18 (28.1%)                       | 22 (19.8%)                        |         |
| Birthweight               |                                  |                                   | 0.000   |
| <1500 g                   | 20 (31.2%)                       | 82 (73.9%)                        |         |
| ≥1500 g                   | 44 (68.8%)                       | 29 (26.1%)                        |         |
| Gestational age           |                                  |                                   | 0.544   |
| Small for gestational age | 14 (21.9%)                       | 17 (15.3%)                        |         |
| Appropriate for gestational age | 50 (78.1%) | 94 (84.7%)                     |         |
| Mechanical ventilation    |                                  |                                   | 0.012   |
| Invasive mechanical ventilation | 29 (45.3%) | 31 (27.9%)                     |         |
| Non-invasive mechanical ventilation | 4 (6.2) | 5 (4.5)                        |         |
| Others                    |                                  |                                   |         |
| Sepsis                    | 29 (45.3%)                       | 18 (16.2%)                        |         |
| Necrotizing enterocolitis | 0 (0)                             | 1 (0.9)                            | 0.388   |
| Intracerebral haemorrhage | 6 (9.4)                           | 4 (3.6)                            | 1.000   |
| Patent ductus arteriosus  | 4 (6.2)                           | 2 (1.8)                            | 1.0000  |
| Phototherapy              | 43 (67.2%)                       | 78 (70.3%)                        | 0.008   |
| Intensive care unit admission | 22 (34.4) | 21 (18.9%)                     | 0.837   |
| Steroid use               | 17 (26.6%)                       | 34 (30.6%)                        | 0.013   |
| Surfactant use            | 11 (17.2%)                       | 28 (25.2%)                        | 0.005   |
| Meconium aspiration       | 2 (3.1)                           | 0 (0)                             | 0.522   |
| Fetal hydrothorax         | 1 (1.6)                           | 0 (0)                             | 1.000   |
| Diaphragm hernia          | 1 (1.6)                           | 0 (0)                             | 1.000   |

### Table 3: Comparison of WISC-R scores between the control and case groups

| Variable                  | Case group (n=175) | Control group (n=63) | p value |
|---------------------------|--------------------|----------------------|---------|
| Age (years)               | 9.4±1.7            | 9.8±2.1              | 0.3     |
| WISC-R Verbal Score       | 92.1±19.519        | 85.1±20.8            | 0.034   |
| WISC-R Performance Score  | 98.8±19.457        | 92.5±16.5            | 0.02    |
| WISC-R Total Score        | 95.4±18.964        | 87.9±18.3            | 0.008   |

Values are expressed as mean ± standard deviation.

### Table 4: WISC-R score comparison in preterm babies

| Variable                  | ≤31 weeks (n=64) | ≥32 weeks (n=96) | p value |
|---------------------------|-----------------|-----------------|---------|
| Age (years)               | 9.5±1.7         | 9.4±1.9         | 0.697   |
| WISC-R Verbal Score       | 91.4±19.4       | 93.4±18.9       | 0.682   |
| WISC-R Performance Score  | 100.2±18.9      | 98.2±19.3       | 0.532   |
| WISC-R Total Score        | 95.7±18.8       | 96.04±98        | 0.95    |

Values are expressed as mean ± standard deviation.
There were no significant differences between groups in terms of other risk factors.

A comparison of the WISC-R scores of the case and control groups showed that the WISC-R Verbal Score and WISC-R Total Score were statistically significant between the case and control groups, whereas the WISC-R Performance Score and age were not statistically significant (Table 3). When analysed by gestational age, no statistical significance was found between the WISC-R Verbal, WISC-R Performance, and WISC-R Total scores as a function of gestational age (Table 4).

No statistically significant difference was found between previous and current psychiatric diagnoses compared with week of birth for preterm babies. The most common psychiatric diagnoses in preterm babies were enuresis and generalized anxiety disorder (Table 5).

### 4. DISCUSSION

Ensuring that preterm babies have lower morbidity, higher functionality, and participate in society as healthy individuals in the long term is an important public health issue. Cognitive function is also among the issues that form the cornerstone of functionality in this sense. In addition, it is very important to identify and find solutions to neurodevelopmental problems that may develop with close observation. In developed countries, preterm babies are regularly monitored after discharge with a multidisciplinary approach (pediatrician, neurologist, physiotherapist, psychologist, psychiatrist, etc.) and general health problems affecting development, including neurodevelopmental areas, are identified so that these children have the chance to adapt to society and become healthy individuals. Therefore, there are many studies in the literature with long-term results on neurodevelopmental monitoring published in developed countries [11]. However, the data from our country are limited. The reason that led us to conduct research on this topic was to follow the social developments by evaluating the cognitive functions of preterm babies in our country.

In previous studies conducted in the field of child psychiatry in our country, it was found that there were more male cases (> 60%) [14-19]. Tanrıöver et al. [14] based this on the fact that more boys are brought to the child and adolescent mental health and illness outpatient clinics. Although boys were more common in our study sample, the gender distribution was narrower than in other studies (male case rate 54.9%). The reason could be that the sample consisted of volunteers and that families with preterm babies are more sensitive about the follow-up of their children.

Functions such as attention, visual differentiation, serial memory performance, and visual-motor coordination are defined as cognitive functions. In a study that investigated the cognitive functions of preterm babies during childhood, it was found that these children fell significantly behind only in serial memory performance [20]. There are different opinions in different studies. Two studies similar to ours reported that preterm children scored significantly lower in intelligence than controls but still within normal limits, which is consistent with the fact that negative cognitive outcomes are more common in extremely preterm babies [21, 22].

It has been observed that the interaction of premature children with developmental risks, especially in the area of language, with the caregiver/people in their home environment, is effective in addressing developmental delays or risks because of premature birth [23]. In a study conducted in the Netherlands, neurological assessment was the best determinant of cognitive development in infants at one year of age, while home environment assessment along with neurological assessment was the best determinant of cognitive development in ELBW babies at two years of age. This study showed that children aged 12-42 months were able to catch up with a cognitive delay when provided with a stimulating home environment [24]. The association between home environment and cognitive function was not

### Table 5: Psychiatric diagnoses in preterm babies

| Disease                        | Current psychiatric diagnoses | Past psychiatric diagnoses |
|-------------------------------|-------------------------------|----------------------------|
|                               | ≤31 weeks n=37 (%) | ≥32 weeks n=29 (%) | p value | ≤31 weeks n=43 (%) | ≥32 weeks n=16 (%) | p value |
| Attention deficit hyperactivity disorder | 3 (8.1) | 7 (24.1) | 0.429 | 2 (4.7) | 3 (18.7) | 0.395 |
| Tourette syndrome             | 2 (5.4) | 0 (0)   | 0.522 | 5 (11.6) | 2 (12.5) | 0.711 |
| Enuresis                      | 10 (27.1) | 8 (27.6) | 0.577 | 14 (32.6) | 6 (37.5) | 0.319 |
| Encopresis                    | 4 (10.8) | 1 (3.5)  | 0.622 | 4 (9.3)  | 1 (6.3)  | 0.621 |
| Generalized anxiety disorder  | 8 (21.6) | 3 (10.2) | 0.524 | 8 (18.6) | 1 (6.3)  | 0.089 |
| Obsessive compulsive disorder | 0 (0)   | 2 (6.9)  | 0.164 | 1 (2.3)  | 0 (0)    | 1.000 |
| Separation anxiety            | 3 (8.1) | 2 (6.9)  | 1.000 | 4 (9.3)  | 0 (0)    | 0.154 |
| Social phobia                 | 3 (8.1) | 1 (3.5)  | 0.664 | 3 (7.0)  | 1 (6.3)  | 0.648 |
| Phobia                        | 2 (5.4) | 1 (3.5)  | 1.000 | 1 (2.3)  | 0 (0)    | 1.000 |
| Major depression              | 2 (5.4) | 4 (13.8) | 0.221 | 1 (2.3)  | 2 (12.5) | 0.522 |
examined in our study.
In the study conducted by Arhan et al. in our country [25], it was found that the preterm group performed worse in the verbal and material ability scales compared with the control children, performed similarly poorly in the attention, and reasoning functioning scales, which is consistent with previous reports [26-28].
The WISC-R subtest scores showed that preterm children lagged far behind term children in general knowledge, language skills, processing speed, and working memory. Our study findings were similar to those of a follow-up study conducted with preterm babies by Fedrizzi et al. In that study, it was found that there were no differences in general knowledge, verbal, and performance subtests in low-risk preterm babies at age 7 years [29]. When comparing the WISC-R score, which was used to evaluate cognitive function in our study, no statistical significance was found between the preterm groups according to the week of gestation. However, comparison of the WISC-R scores of the case and control groups revealed that the WISC-R Verbal Score and WISC-R Complete Score were statistically significantly higher in the case group.
When the psychiatric diagnoses of the preterm babies who formed the study group were compared, no difference was found between the two groups because the week of birth was taken into account. In studies conducted in our country, the most common diagnoses were MBD, mental disability, and anxiety disorders [19, 30-32]. In the study by Sevgen et al. [33], children aged 0-5 years were studied. The most common diagnoses were stimulus deficiency, adjustment disorder, autism spectrum disorder, global developmental delay (GDD), attention deficit hyperactivity disorder (MBD), stuttering, abstinence disorder, limit-setting problem, articulation disorder, oppositional defiant disorder, and separation anxiety. It was also found that enuresis and anxiety disorder was the most common psychiatric diagnoses in our study.
In the study conducted by Çak Esen et al. [34] at Hacettepe University, attention deficit hyperactivity disorder and its associated prenatal risk factors were investigated in preterm children. The results of this study showed that children diagnosed with attention deficit hyperactivity disorder had a smaller birth week and birth weight, that these children were more likely to suffer from respiratory distress syndrome. In addition, it was also observed an increased history of surfactant and mechanical ventilation therapy, a longer hospital stay in the neonatal period, and that they came from a family with a high socioeconomic level, which was associated with a lower number of diagnoses of attention deficit hyperactivity disorder. It was determined that the variable most strongly associated with a diagnosis of attention deficit hyperactivity disorder among all factors was week of gestation. In our study, the comparison between groups was made only by week of gestation and not by psychiatric diagnoses.
As a result, the WISC-R score, although not different for classification of preterm babies, was statistically significantly higher in the case group than in the term group. This situation differs from reports in the literature that preterm babies have a lower WISC-R score and indicates the need to investigate this situation through further studies and even with other tests.

5. STUDY LIMITATIONS

Our study, which was a single-center study, included only children born to families who consented to the study. The families who consented to participate in the study were aware families, which may generate bias. Only preterm children were evaluated with the WISC-R score in our study because of time and staff limitations. Studies can be planned to include more cognitive function tests and sociodemographic information about families.

6. CONFLICT OF INTERESTS

The authors declare no conflict of interest.

7. REFERENCES

1. Volpe JJ. Brain injury in premature infants: a complex amalgam of destructive and developmental disturbances. Lancet Neurol. 2009;8(1):110-24. doi: 10.1016/S1474-4422(08)70294-1.
2. Martin JA, Kung HC, Mathews TJ, Hoyert DL, Strobino DM, Guyer B, et al. Annual summary of vital statistics: 2006. Pediatrics. 2008;121(4):788-801. doi: 10.1542/peds.2007-3753.
3. Woodward LJ, Edgin JO, Thompson D, Innes TE. Object working memory deficits predicted by early brain injury and development in the preterm infant. Brain. 2005;128(Pt 11):2579-87. doi: 10.1093/brain/awh618.
4. Strauss RS. Adult functional outcome of those born small for gestational age: twenty-six-year follow-up of the 1970 British Birth Cohort. JAMA. 2000;283(5):625-32. doi: 10.1001/jama.283.5.625.
5. Zwicker JG, Harris SR. Quality of life of formerly preterm and very low birth weight infants from preschool age to adulthood: a systematic review. Pediatrics. 2008;121(2):e366-76. doi: 10.1542/peds.2007-0169.
6. Dalziel SR, Lim VK, Lambert A, McCarthy D, Parag V, Rodgers A, et al. Psychological functioning and health-related quality of life in adulthood after...
preterm birth. Dev Med Child Neurol. 2007;49(8):597-602. doi: 10.1111/j.1469-8749.2007.00597.x.

7. Chapiecki ML, Evankovich KD. Behavioral effects of prematurity. Semin Perinatol. 1997;21(3):221-39. doi: 10.1016/S1096-0755(97)80065-1.

8. Otten E. The structures of the WISC-R subtests: a comparison of the IQ-profiles of reading impaired and autistic subjects. Scand J Psychol. 1999;40(1):1-9. doi: 10.1111/1467-9450.00092.

9. Savasır I, Şahin, N. Wechsler çocuklar için zeka ölçgesi (WISC-R) uygulama kitabı. Ankara: Türk Psikologlar Derneği; 1995.

10. Çelik C, Yiğit I, Erden G, Vural M. Zihinsel gelişim geriliği olan çocuklarda Wechsler Çocuklar İçin Zeka Ölçüğü Geliştirilmiş Formunun faktör yapınan incelenmesi. Çocuk ve Genç Ruh Sağlığı Dergisi. 2016;23(1):17-28.

11. Çelik C, Yiğit I, Erden G. Wechsler Çocuklar İçin Zeka Ölçüğü Geliştirilmiş Formunun Doğrulukları Faktör Analizi: Normal zihinsel gelişim gösteren çocukların olağanüstü bir örneklem. Türk Psikoloji Yazılımları. 2015;18(35):21-9.

12. Göktürk M, Uluf, F, Pehlivanbürk B, Kültür EÇ, Akdemir D, Taner Y. [Reliability and Validity of Schedule for Affective Disorders and Schizophrenia for School Age Children—Present and Lifetime Version—Turkish Version (K-SADS-PL-T)]. Çocuk ve Gençlik Ruh Sağlığı Dergisi. 2004;11(3):109-16.

13. Damenci L, Erol N, Achenbach TM, Simsek Z. Measurement structure of the Turkish translation of the Child Behavior Checklist using confirmatory factor analytic approaches to validation of syndromal constructs. J Abnorm Child Psychol. 2004;32(3):335-40. doi: 10.1023/B:JACP.0000026146.67290.07.

14. Tanrıöver S, Kaya N, Tüzün Ü, Akyolmuş K. Çocuk psikiyatri polikliniği başvuran çocukların demografik özellikleri ile ilgili bir çalışma. Düşünen Adam Psikiyatri ve Nöroloji Bilimleri Dergisi. 1992;5:13-9.

15. Epri N. Bir çocuk sağlığı kliniğine başvuran çocuklara ilgili incelemeler. Milli Psikiyatri ve Nöroloji Bilimleri Kongresi Özet Kitabı. 1974:161-4.

16. Sonverb B, Yörükoğlu A, Öktém F, Akyıldız S. Hacettepe çocuk ruh sağlığı kliniği ile iki yıl içinde görülen çocukların demografik özellikleri. Psikoloji Dergisi. 1982;13:33-9.

17. Yöntem Fidan T. [Assessment of Mental Symptoms and Risk Factors in Children and Adolescents Who Admitted to the Child Adolescent Psychiatry Clinic]. Konuralp Medical Journal. 2011;9(1):1-8.

18. Ersöz Alan B. Çocuk ve erken psikiyatri polikliniği başvuran hastaların bazı özellikleri. Türk Child Clin. 2019;10(4):494-91. doi: 10.18663/tjcl.151659.

19. Akdemir D, Çuhadaroğlu Çetin F. Çocuk ve erken psikiyatri polikliniği başvuran engellerin klinik özellikleri. Çocuk ve Genç Ruh Sağlığı Dergisi. 2008;15(1):5-13.

20. Türkoğlu S, Çocuk ve Ergen Psikiyatri Polikliniği Başılan Hastalarda Tani Dağılımları. Selçuk Tip Dergisi. 2014;30:118-22.

21. Frisch G, Winkler E, Flannery A, Müller WD. [Neuropsychologic and logopedic follow-up of 6 to 8-year-old former premature infants with a birth weight below 1,501 g]. Mutat Res Kinderheilkd. 1986;134(9):687-91.

22. Soria-Pastor S, Padilla N, Zubiaga-Elorza L, Ibarretxe-Bilbao N, Botet F, Costas-Moragas C, et al. Decreased regional brain volume and cognitive impairment in preterm children at low risk. Pediatrics. 2009;124(6):e1161-70. doi: 10.1542/peds.2009-0244.

23. Marlow N, Wolke D, Bracewell MA, Samara M; EPICare Study Group. Neurologic and developmental disability at six years of age after extremely preterm birth. N Engl J Med. 2003;352(1):9-19. doi: 10.1056/NEJMoa041367.

24. Savas F, Bıçakçı M. [Opinions of Mothers with Premature Children: Risk or Non-Risk For Language Development Delay? Regard to Communicate With Their Children]. Çocuk ve Gelişim Dergisi. 2019;24(26-43). doi: 10.36731/cg.658558.

25. Arhan E, Güçlüyener K, Soyalı Ş, Savarlı Ş, Gürses MA, Serdaroğlu A, et al. Regional brain volume reduction and cognitive outcomes in preterm children at low risk at 9 years of age. Childs Nerv Syst. 2017;33(8):1317-1326. doi: 10.1007/s00381-017-3421-2.

26. Peterson BS, Vohr B, Stahl LH, Cannistraci CJ, Dolberg A, Schneider KC, et al. Regional brain volume abnormalities and long-term cognitive outcome in preterm infants. JAMA. 2000;284(15):1939-47. doi: 10.1001/jama.284.15.1939.

27. Delobel-Ayyoub M, Arnaud C, White-Koning M, Casper C, Pierrat V, Garel M, et al. Behavioral problems and cognitive performance at 5 years of age after very preterm birth: the EPIDiGE Study. Pediatrics. 2009;123(6):1485-92. doi: 10.1542/peds.2008-1216.

28. Ayldward GP. Cognitive and neuropsychological outcomes: more than IQ scores. Ment Retard Dev Disabil Res Rev. 2002;8(4):234-40. doi: 10.1002/mrdd.10043.

29. Fedrizzi E, Zuccarino ML, Vizzetti P. Clinical problems in neurodevelopmental diagnosis: a 7-year neurological and psychological follow-up study of low risk preterm infants. Ital J Neurol Sci. 1986;Suppl 5:117-26.

30. Abal O, Durukan M, Mukaddes NM, Polvan O. [The Assessment of Patients at the Child Psychiatry Outpatient Clinic]. Haseki Tip Bülteni. 2006;44:1-7.

31. Durukan İ, Karahan D, Kara K, Türker T, Tufan AE, Yalçın Ö, et al. Diagnoses of patients referring to a child and adolescent psychiatry outpatient clinic. Düşünen Adam. 2011;24:113-20.

32. Sarı BA. Batman’da çocuk psikiyatri polikliniği başvuran hastalarda belirli ve tani dağılımları. Klin Psikiyatri Derg 2013;16:7-17.

33. Sevgi HF, Alton H. Çocuk ve Ergen Psikiyatri Polikliniği Başılan 0-5 Yaş Arasında Çocukların Büyük Açıklaması ve Psikiyatrik Tamlamalar. Journal of Mood Disorders. 2017;7(4):205-11. doi: 10.5455/jmood.201708060212.

34. Çak Esen HT, Göktürk M. Erken doğan çocuklarda dikkat eksikliği hiperekativite bazalça ve ilişkili doğum öncesi risk etkenleri. Türk Psikiyatri Arşivi. 2013;48(2):679-82.