



VALIDITY-RELIABILITY STUDY OF BRIGANCE K&1 SCREEN II KINDERGARTEN FORM AND EVALUATION STUDY BY SCANNING THE DEVELOPMENT OF 5-YEAR-OLD CHILDREN

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ABSTRACT

The Purpose of Research is to provide an alternative tool for assessing roughly children who show average, below average and fast-development based on the development levels of children at preschool period by conducting the validity and reliability research of Brigance K&1 Screen II Kindergarten Form. The population of the research is the children aged between 5 and 5, 5 who attend the preschool education institutions in Ordu city. Of these children, 338 children randomly selected were the sample group. The research was carried out in two stages. Validity-reliability work at the first stage application work at the second stage was carried out. The validity and reliability of the research was carried out in the two fall semester of the academic year 2015-2016 and 2016-2017. Implementation study was carried out in 2017-2018 with 262 children of five years old who continue to pre-school education institutions during the fall semester. The research was conducted by using the screening model in the quantitative research method. Data collection tools are "Brigance K&1 Screen II (Brigance Kindergarten and 1'st Class Primary School Screen II) Kindergarten Form". Screening Forms were applied to children in groups and individually. The data analysis was processed to the SPSS-21 statistical program and Explanatory Factor Analysis (EFA) was used for the form structure validity and Cronbach Alpha statistics were used for its reliability. As a result of the research, the Form is seen to comprise of 3 factors and 12 items. The factor loads of the items vary between 0.42 and 0.80 in the first factor (Academic Skills), between 0.58 and 0.62 in the second factor (Language and Communication Skills) and between 0.41 to 0.84 in the third factor (Motor Skills). It was evaluated that each item had internal validity with item-total correlation values above 0.40 and when three factors are considered for the form's reliability and Cronbach Alpha internal consistency coefficients of the items determined for the general form are considered, the first factor is 0.72, the second factor is 0.66 and the third factor is 0.62, and thus, they have an acceptable level of reliability with an overall reliability coefficient of 0.79. As a result, the Brigance K&1 Screen II Kindergarten Screening Form is valid and reliable for assessing roughly the development of children aged 5 with low, medium and high level and possible development problems. At the end of the application each child's screening assessments were scored and a ranking was made based on the total scores. As a rough assessment, the total scores of the children were grouped into the lower, middle and upper development level according to the score range of the test. According to the rough assessment on the total scores, the individual development of the children may vary compared to each other and according to their classes.

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INTRODUCTION

Child development is considered to have long and lasting effects in the subsequent development of various skills and competencies during the critical period of five years after birth. Certain environmental experiences of children in early childhood years significantly influence subsequent knowledge, cognitive skills and basic social-emotional skills.

Recent researches have revealed that cognitive development is progressing much faster in the early years of life than in other developmental areas. In particular, infancy and first childhood years are important as they form the basis of future periods and ensure that the innate potential is properly used with appropriate educational interventions and rich content environment to be created. The brains of young children are highly susceptible and open to new experiences until the age of five. By the age of three, children's brain development can reach 90% of the adult rate (Smutny *et al.*, 1997; Shore, 1997; Shonkoff ve Meisels, 2000; Pool ve Hourcade, 2011;

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Dağlıoğlu, 2014). It is known that intelligence development substantially occurs in the preschool period. In this sensitive period, it is important to create educational environments that will meet the learning curiosity and research desire of children and develop their creativity in order to prevent the regression of their talents and potential talents (Trawick-Smith, 2014). In the literature, the concept of early intervention is used both at an early age and to provide appropriate educational support for the child without increasing the intervention deficit. Applications that start immediately after birth may be called "timely intervention". Because the need is determined and should be done in the known and positive results are taken when it is done, it can be called intervention in time at a young age.

Childhood has its own cognitive, social, emotional and physical characteristics. Children's needs can only be met by adults who will guide them (Sword, 2012). It can be said that the most important requirements out of these requirements are the educational needs after the vital ones. notwithstanding that the developmental characteristics of children are similar, individual differences exist and thus, it is important to educate them. In terms of their overall development and individual developmental characteristics in order to develop their potential and intellectual abilities in the right direction. It is necessary to determine their needs correctly in order to provide proper training and development environments. Children can show normal, below average and fast development as a developmental process. There may also be cases where special requirements are in question. Recording the skills that are developing or are being acquired and taking them into account for future evaluations may contribute to the correct monitoring of the development process. "Assessment is defined as the process of identifying individuals with their strengths and weaknesses and determining their needs through different measurement tools and techniques (McLoughlin ve Lewis, 1990, Shonkoff & Phillips, 2000; Ataman, 2014, Trawick-Smith, 2014). developmental evaluation focuses on a very broad area that can encompass the development-related aspects of (fine and gross motor skills, cognitive-language, social and emotional development). It may evaluate these aspects individually or cover them as a whole (Meisels, 1991; 1992; Shonkoff ve Meisels, 2000; Snow ve Van Hemel, 2008). developmental evaluation provides a versatile data source for adults and professionals who are responsible for the child's education for getting to know the child through the eyes of a professional and preparing a group and individual education program and integration program. Screening assessments are quick and effective means of providing screening tools that can be used by the teacher or other adults who are closely involved with the child, providing information about the child's developmental level and special circumstances, without involving the child.

According to the May and Kundert (1993) study, 33% of New York City schools use structured as regional testing, 30% use developmental screening tests measurements, 28% skills-based literacy readiness measurements, and 20% use informal observations.

Except for a small number of private kindergartens in Turkey, no screening practices come across while starting state preschools and kindergartens in Turkey. Only in hospitals under the supervision of physicians, any disease detected after birth, mental retardation, autism, Down syndrome,

phenylketanör, such as unusual cases are diagnosed. According to the evaluations of psychologist (Intelligence tests) and pediatrician (developmental screening tests) in the baby or child hospital by the physician, special education centers and state institutions that give education to normal developing children are referral by the physician. There may also be cases in Turkey where special education and individual support education needs of some children should be met without official diagnosis. Diagnosis may be deferred to elementary school years since development still continues in the preschool years. In this period, which can also be called pre-diagnosis, the inclusion of the child in the systematic evaluation and support process will be a positive approach.

Research sources in the United States indicate that medical and developmental screening performed under the supervision of physicians is not sufficient to identify delays and deficiencies in child development. Only 45 to 55 percent of children with developmental disabilities are identified before start the school in England. Mental retardation using only clinical judgment determines less than 30% of children with language impairments or other mental problems (Sand *et al.*, 2005). Similarly, less than 50% of those with serious emotional and behavioral problems before the age of 5 are identified. In another study, children's doctors' intuitions for behavioral problems were compared to a complete standardized assessment and the sensitivity of pediatricians was low (20%) (Laving and *et al.*, 1993). In the United States, clinical evaluations determine only 30% of children with developmental disabilities, and currently only 20% to 30% of children with disabilities are identified before school begins. On the contrary, the sensitivity and specificity of standardized developmental screening tools is between 70 and 90%. The rate of use of screening tests in clinical evaluations of pediatricians is 23%. The complement of developmental monitoring is developmental screening, as a result, inclusion of screening tests is considered an advantageous paradigm for identifying developmental disorder (Majnemer, 1998; Sand *et al.*, 2005; Rydz *et al.*, 2005).

Simple, easy-to-apply and economical practices that are natural for children and tools that can provide comprehensive information are needed to enable all these aspects to be determined, a proper and sufficient education to be provided and systematic assessments to be made. Determining the strengths and weaknesses of children and supporting them at their own pace of development, meeting their special and individual educational needs with timely intervention and giving education in line with the pace of development will positively affect their development (Meisels, 1991; ; Shonkoff ve Meisels, 2000; Snow ve Van Hemel, 2008; Brenneman, 2011, Bredekamp, 2015, Atay, 2009; Robinson, Shore ve Enerson, 2014). As a fast and undetailed practice, general screening tests from among the assessment tools include tests that can be applied to all children to determine their level of development, learning characteristics, insufficiency and high-level training needs (Culberston ve Willis, 1993; Groves ve Horn-Wingerd, 2000, Ataman, 2009; Pooland Hourcade; 2011; Elella and *et al.*, 2017); Cohen ve Swerdlik, 2015.).

The assessment tools provide an opportunity to make an assessment from different perspectives when they can be applied by the professional who is responsible for the child's education, family and the adult who knows the child well and is responsible for his/her care. These tools should be eligible

for providing versatile information that can be obtained by applying them and observing the child in his/her habitat ((Pool and Hourcade, 2011; Macy, 2012; Ataman, 2014, Şahin, 2014).

Generally, related to early childhood diagnostic tools make it possible to diagnose them cognitively and mentally only when the child turns 6 years old. It is also necessary to determine current development state and potential interests and skills of children in order to be able to meet developmental and individual needs of children specific to this preschool period with proper and adequate educational environment as it will form the basis of primary/elementary education (Ataman, 2009; Elella and *et al.*, 2017).

Screening tests used in early childhood are critical for the determination of gifted and gifted children with special needs and for the realization of early educational intervention required by their superior abilities and potentials. Early recognition and formal recognition of gifted children are important to help them learn in their early years and to prevent disinterest and negative attitudes towards school (Kaplan and Hertzog, 2016). Early identification and appropriate educational intervention for gifted preschool and kindergarten students increases the likelihood of future outstanding achievement, but reduces the risk for subsequent social, behavioral, emotional and / or educational problems (Harrison, 2004; Hodge & Kemp, 2000; Morelock & Feldman). 1992, Pfeiffer & Stocking 2000, SankarDeLeeuw, 2002).

Cao and *et al.* (2017) evaluated research on gifted and gifted children for diagnostic purposes in 2005-2016. According to this, 128 (86%) of the 148 investigations evaluated are for diagnostic purposes. 14 (9%) research on the development of gifted students and detailed evaluation for the gifted program, and 8 on the documents related to the development of gifted talents.

According to Borland and Wright (1994), the scales used in the diagnostic process of high-talented and high-potential children should be valid and reliable. In the nature of diagnosis, the child's problems, weaknesses and needs should be identified as well as strengths, potentials and abilities. Children with high ability and potential can be guided for further evaluation after the screening test. In pre-school years, where development has not yet been shaped and cannot be fully get bearings, children may be involved in early intervention, after a rough screening evaluation, in which they may benefit individually. Developmental or learning delays in one or more areas of a gifted child can be revealed in a careful screening test application.

The tools used to identify gifted and talented children are in the form of ability and achievement tests, creativity tests, intelligence tests, portfolios, and nominations (Cao and *et al.*, 2017).. Screening tests can be useful in identifying children with high intelligence and potency that can be difficult to express in a short period of time, especially when they are young. Preschool assessments are made considering the areas of development, and gifted and talented children are likely to identify areas where they are strong, normal developments and weaknesses, and areas where they may need special training.

Sensitivity and Specificity of Screening Tests According to Brigance Scans Technical Report

Sensitivity: Percentage of children correctly identified with a screening test (eg, with failed, abnormal or positive results), sensitivity. At least 70% of children with real problems should fail in Brigance screenings.

Specificity: The percentage of actual difficulties encountered in the scan with normal or negative findings is specificity. Because a normally developing child is much more than the others, it should go through nearly 80% of Brigance screening for unproblematic children.

Pool J. L. L. and Hourcade, Jack J. (2011). The sensitivity of the Brigance screening tests was 70% to 80% and specificity was 70% to 80% in the research that evaluated the screening tests. In the study of Wenner (1995), sensitivity, specificity and predictability of Piaget task Instrument (PTI), Brigance K & 1 Screen kindergarten and first grade (BKS) and Merrill language screen screening test (MLST) were compared. 95 white, middle-class 56-67 month-old children were screened by 3 researchers before entering the nursery and follow-up evaluation was completed after 11 months. Teachers who follow up the test are not aware of the initial results. The PTI specially designed for the present study has been found to have poor predictive qualities. Both published instruments found a general-purpose kindergarten scan, BKS, and a language-specific scan, MLST, which could guide teachers' referral and maintenance guidelines. (PsycINFO database registration (c) 2016 APA, all rights reserved.).

According to Rydz (2005), the accuracy of the test is often expressed in terms of sensitivity and specificity to measure what the measure means. Sensitivity refers to the proportion of all individuals who have a problem that the test will correctly identify; gives the possibility of correctly identifying the problematic individual in any case. Özgüllük, tarama testinin herhangi bir durumda olmayan bireyleri doğru olarak tanımlayabilmesidir. As a result, a sensitivity of 100% indicates that the test will accurately determine each of the conditions in question, and a specificity of 100% will test negative individuals with no problem. The limit score is a exchange between sensitivity and specificity, and it has critical importance in determining the true values sensitivity and specificity of a test. Macy (2011) emphasizes the necessity for the continuation of the research on the screening tools and their application on the basis of experimental findings.

Although there are various tools serving to this purpose in Turkey, there is still a need for multiple tools in diagnostics and supporting programs for appropriate education and further evaluation (Atay, 2009).

It is considered that the need for tools in this field can be met by conducting a validity and reliability research of the tool that was previously translated into Turkish.

Purpose of Research

In the first stage, the validity and reliability study of Brigance K & 1 Screen II's Kindergarten Form (5 years old) translated into Turkish by Darga and Ataman (2010) is done and then the developmental evaluation of the children is applied to Form 5 years old preschool students.

Importance of Research

It is necessary to determine development characteristics of age group in early childhood, provide proper guidance and to monitor the process with re-assessments at regular intervals in order to determine the needs. It is important that this tool comprises of forms applied at different ages and these forms are in correlation with each other for creating an integrity.

METHOD

Research Model

The screening model was used in the research. Screens with group and individual applications (5years old) were made with Brigance Kindergarten Form. The first stage this research is qualified as the basic research since it is the research where the validity and reliability analyses of the scale are conducted. This part includes the research group of the research, the development of the measurement tool, the application of the measurement tool and the techniques used to analyze the data. The distribution of the research group, which is composed of the schools in the quarters with different socio-economic characteristics of Ordu province, is given in Table 1.

Table 1 Research Group and Schools

Name of School	Date of Screening and The Number of Children	
	2015 -2016 Fall Semester	2016 -2017 Fall Semester
Altaş Koleji Kindergarten	62	35
75. Yıl Kindergarten	71	
Şehit Ümit İnce Kindergarten	52	20
VHB Adil Karlıbel Primary School Kindergarten		20
Başöğretmen Primary School Kindergarten		40
Akyazı Çamsan Primary School Kindergarten		20
Şehit Ersin Bacaksız Primary School Kindergarten		35
Total	185	170
Grand Total		338
Out of Assessment		17

Data collection tools

“Kindergarten Data Sheet” was used by the researcher for screening.

Kindergarten Data Sheet: This screening form used by the researcher comprises of 12 sub-aspects such as Personal Data, Identifies Body Parts, Gross Motor Skills, Color Recognition, Visual Motor Skills, Drawing a Person (Body Image), Personal Data Writing, Rote counting, Numerical Concepts, Reading Capital Letters (alternatively, small letters), Syntax and Fluency. There are different numbers of metrics for each sub-aspect. 3 items of the form are applied either individually or in group, while other items are applied individually by asking the child to show verbal, written, drawing and motor skills according to the skill assessed by each item. Each item has a different scoring guide and is available on the form, next to the concerned item. Materials used in the screening of Formulas 9A and 10A were prepared by the investigator in accordance with the materials testing guidelines. In parallel with the "screening observation form" used during the screening test of the Brigance Kindergarten Form, similar and different evaluation forms filled in by the teacher and parents were also applied, but the validity and screening evaluations were included in this article.

Brigance K&I Screen II involves two forms applied to preschool (aged 5) and first grade (aged 6) children. Kindergarten (aged 5) form of the Scale was used in this research.

Consent and Application

After the necessary consents were obtained, the schools with which the research would be conducted were contacted. The room where the assessment would be made and the position of table where the test would be applied were adjusted to be minimally affected by the stimulating/ distracting aspects of the environment. Parents were sent an information note and asked to give their consent and the screening assessments started one or two days later.

Research Environment

The assessment room was the environment that is used as office, parent-teacher meeting room or drama room in the kindergarten and the guidance room, meeting room, science-technology class or vacant classroom, except kindergarten class, in the primary school. In the primary schools, it was applied at the entrance and on the 1st or 2nd floors. In both cases, the noise level in the environment distracted the child. Sometimes, children who were assessed could predict what was being done outside from noises. In cases that coincided with playtime, the items that required less attention and focus were applied to children. Although teachers or other personnel were warned earlier, they opened the door of the assessment room and went in and out the room with various excuses.

Application Process

Having informed the teacher and made a preliminary interview with the teacher, the researcher entered the class and introduced herself to the children and said "Hello, children! My name is Hatice. I work as a teacher at university". Their teacher then explained to children "You know, some elderly sisters visit our class who will become teachers in the future. Teacher "Hatice is their teacher". The researcher said "Yes, my students told me that they had played very entertaining games and made various pleasant activities with you. I also wanted to make an activity with you. Will you make an activity with me?". After children responded positively to this introduction, the application process began. Taking into account the fact that the children are young and not fully accustomed to the school, two items of the test that can be applied as a group to get closer to children were applied in the class. Immediately afterwards, explanation was made to children as "Children, do you know that there are ... rooms/classes on this floor/hall of your school? Now, we will go with you to room in rows and talk about the drawing you have made. I will ask you some questions, we will play some games and then you will come back to the class". And then the researcher left the class together with the child who would be the first to be assessed as jointly determined with the teacher. Keeping in mind that the children would be affected from each other, it was found appropriate to start with a child who would beware away to come together with someone he/she had recently met.

The application was started by talking about the drawing made by the child, which he/she would be more comfortable to be doing. The same method was applied to all classes. Almost all of the children were very willing and after the application, they said that they loved it. When the researcher returned to class,

almost all of them said they wanted to come back. In some classes, one or two children were withdrawn and reluctant about the assessment. They also participated with the encouragement from their friends and teacher and expressed that they had been happy with the application. Some children asked where they were going when they left the class to be brought to the research area and they said that it was a part of the school that they had never seen before. However, almost all of the children were curious and gave a good reaction, showing their enjoyment. Still some children said that they were bored, but they continued when they were encouraged. However, assessments of children especially with the risk or diagnosis of attention deficit, mental retardation, hyperactivity, inadequacy of learning lasted longer and their attention needed to be drawn frequently. Some of these children were distracted by the noises coming from the outside and some even expressed their disturbance.

Application Duration and Evaluation

The assessment of each child took 30 minutes in average. The screening was conducted at 09.00 - 18.00 at the beginning of the fall semester. At the end of the screening process, children's answers were scored, and the criteria for scoring were determined on condition that scoring directive of the test was complied with. The scores of each subtest and application material are different according to the evaluation made on the total 100 points and the evaluation is made according to the instruction. As for 4B of the Form - reading lowercase/uppercase letters, both italic and non-italic form of letters were asked to be read by children due to cursive italic writing practice in Turkey. Children earned scores for all letters they read. In addition, the writing style in which a particular child could read more letters was taken as basis for the assessment. 9A – Drawing a human figure: In this skill, the child was asked to “draw a human figure”. Here, the scores were given for the “body parts identified” from among the body parts included in the scoring. A score was given to the body part that could be drawn in the correct location in the picture. 1A- Giving Personal Data: “avenue and street names” are asked for “telling home address” part in the 1st sub-aspect of the form. If the child could specify information about the quarter-street-housing complex etc., this was accepted as the right answer for the research. Ordu, where the research was conducted, is a small city and the address information is given by stating the name of the housing complex. For this reason, the answer of the child who could state the name of the housing complex where he/she lives was accepted as correct.

Challenges in the Application

As all the tools of the researcher should be applied alone and individually due to the nature of the tools, the screening duration extended and the intervention by the teacher for giving information during giving directives in the class, the physical conditions of the schools, the young age of the students and recent enrolment to school, the effect on children of conducting the research in a location other than the classroom, cooperating with someone who they do not know and interruption of the assessment for any external reason are test conditions that negatively influence the performance of children.

Data Analysis

The form comprising of 12 items determined appropriately the purpose of the research was applied to 338 children, aged 5, and was then processed into the SPSS-21 statistical program. The application is instructed to discontinue after 1,2,3 wrong answers in each item as per the pre-defined structure of the applied Form. However, since there were children who responded correctly in other steps after 1,2,3 wrong answers during the application, an assessment score was obtained outside the form application directive. As the purpose of the application, as already stated in the Form, is to assess the children properly, i.e. to determine the skill known or acquired by the child, this is reflected in the scoring. Moreover, since the order of skill acquisition by the children in American society and in Turkey may vary, it was applied as follows in order to reveal what children know: (eg: 2A – Identifying Body Parts: Children could not identify the “ankle” in the 2nd order but could identify “waist” that was on the last rank. In addition, 11A – Reading letters item of the Form: the directive is to apply all letters. Thus, an assessment that does not disrupt the form structure was made.

In this context, it was required to redefine the structure of the form. After the application, Explanatory Factor Analysis (EFA) values were calculated for structure validity at the phase of validity and item-total correlation values were calculated for internal validity. At the phase of the Explanatory factor analysis, the factor structure was tried to be defined by the principal components analysis method. The principal components analysis tries to provide the most information about the variables observed by neglecting the error term and using minimum data (Leech, Barrett and Morgan, 2005). The Kaiser-Meyer Olkin (KMO) coefficient and Barlett’s Test of Sphericity were used to determine whether the sample included in the research could be sufficient for sampling factor analysis. The Kaiser-Meyer Olkin (KMO) coefficient provides a criterion for degrees that allow factor analysis. Barlett’s Test of Sphericity shows whether the relations have a significant level (Can, 2014, p. 300). Varimax was used as the factor rotation technique at the phase of explanatory factor analysis. The purpose for using the Varimax rotation technique is to measure different concepts in the literature and statistically of factors that emerge in the developed scale. Varimax rotation technique is used whenever the correlation between the factors is not high and in sampling groups that can be gathered at a sufficient number. Sources recommend to use Varimax method since it distinguishes the factor more clearly (Can, 2014, p.298, Büyüköztürk, Çokluk ve Şekercioğlu, 2010, p.203).

Cronbach's Alpha internal consistency reliability coefficients were examined for the reliability of factor structure in the form and reliability of general form. Cronbach's Alpha reliability coefficient is used when the items are scored as weighted or scored with grading method (Can, 2014, p. 366).

FINDINGS AND DISCUSSION

Findings related to Factor Analysis (EFA) Validity Research

The structure validity of the test was tested by factor analysis in line with the data obtained from the application.

To this end, it was examined whether the data obtained from kindergarten children were suitable for factor analysis.

The results of the Kaiser-Meyer-Olkin (KMO) and Bartlett tests, which show whether the data are suitable for the factor analysis, are shown in Table 1.

Table 2 KMO and Bartlett Test Results

Kaiser-Meyer-Olkin Sampling Compliance Measure		
		,84
	X ²	894,40
Barlett's Test of Sphericity	Sd	66
	p	,000*

*p<,05

When Table 2 is considered, the calculated KMO value of measure compliance is 0.84. Factor analysis cannot be performed below 0.50 that is the critical value according to Leech, Barrett and Morgan (2005) (Akt, Büyüköztürk, Çokluk and Şekercioğlu, 2010). Kaiser states that as the calculated value approximates to 1, the value becomes excellent and if it is below 0.50, it is unacceptable (0.90 and above - excellent; 0.80 - very good; approx. 0.70 and 0.60 – average; approx. 0.50 - poor) (Tavşancıl, 2010).

The calculated Bartlett's Test of Sphericity is 894.40 and is meaningful at the level of 0.05 (X²₆₆=894,40). According to these values, KMO value in the application reveals that data set creates a very good structure for factor analysis. The significant calculation of Bartlett test shows that there are high correlations between the items; in other words, the data set is suitable for factor analysis (Kalaycı, 2009).

Core values and explanation variations of the final form of factor structure revealed by the explanatory factor analysis are given in Table 2.

Table 2 Factor Eigenvalues and Explanatory Variations

Factor	Initial Eigenvalues			Total After Rotation*		
	Total	Vary %	Cum %	Total	Vary %	Cum %
1	3,89	32,39	32,39	2,55	21,29	21,29
2	1,41	11,76	44,15	2,20	18,34	39,62
3	1,04	8,66	52,82	1,58	13,19	52,82

*Varimax rotation technique is used.

As seen in Table 2, there are 3 factors with an eigenvalue greater than 1.0. The variance explained by these three factors is 52.82% of the total variance. When the initial and after rotation values and the explanatory variances of the factors are compared, it is seen that the eigenvalue of the first factor decreases from 3.89 to 2.55 and the explanatory variance decreases from 32.39% to 21.29%. It is seen that the eigenvalue of the second factor increased from 1.41 to 2.20 and the explanatory variance increased from 11.76% to 18.34%. It is also seen that the eigenvalue of the third factor increases from 1.04 to 1.58 and the explanatory variance increases from 8.66% to 13.19%.

The variance values of the factors before and after the rotation decreased in the first factor While increased in other factors

The Factor Conic Plot (Scree Plot) showing the breaking points of the form is shown in Fig.1.

Scree Plot

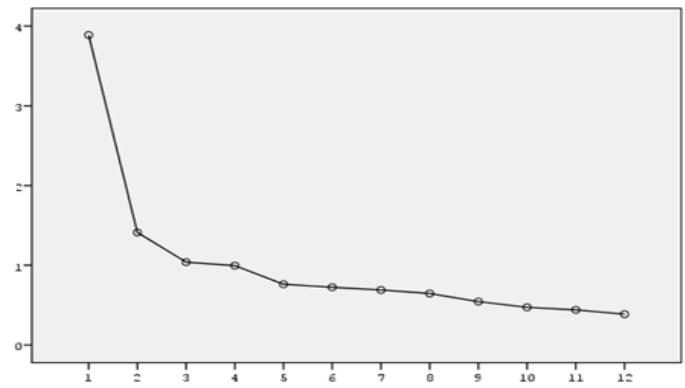


Figure 1 Factor Conic Plot (Scree Plot) Concerning Brigrance Kindergarten Form

When the plot in Figure 1 is considered, 3 separate breaking points can be seen. Although the breaking point of the first factor is slightly greater than the other factors, it is seen that there are 3 different breaking points higher than 1 eigenvalue. When the Factor Conic Plot (Scree Plot) is examined, the form is seen to have a 3-factor structure.

The factor load values and item total correlation values of the items of the 3-factor structure determined for the Brigrance Kindergarten form are shown in Table 3.

Table 3 Factor Load Values, Item Total Correlation Values and Reliability Coefficients of Items

Item	Sub-Factors of Brigrance Kindergarten Form			Item Total Correlation Value	Reliability of Sub-Factors	Reliability of General Form
	Academic Skills	Language and Communication Skills	Motor Skills			
A10	0.80			0.58*		
A9	0.79			0.67*	0.72	
A8	0.76			0.63*		
A4	0.42			0.33*		
A12		0.62		0.32*		
A7		0.62		0.40*		
A2		0.61		0.50*	0.66	0.79
A11		0.61		0.42*		
A1		0.58		0.46*		
A6			0.84	0.46*		
A3			0.79	0.37*	0.62	
A5			0.41	0.32*		

*p<,05

When Table 3 is considered, Item 4, 8, 9 and 10 have the highest factor load value in the first factor and Item 1, 2, 7, 11 and 12 have the highest factor load value in the second factor and Item 3, 5 and 6 have the highest factor load value in the third factor.

It is seen that factor loads of the items in the first factor vary between 0.42 and 0.80; the factor loads of the items in the second factor vary between 0.58 and 0.62; the factor loads of the items in the third factor vary between 0.41 to 0.84. According to Tabachnick and Fidell (2001), each item was determined to be "medium" if the load value is below the critical value of 0.40. It is seen that there is no item with a factor load value below 0.40.

As a result of the item total correlation analysis calculated for 12 items of the form, it is seen that the correlation values between the items in the form vary between 0.32 (Item 5 and

12) and 0.67 (Item 9) and the correlation between the item and factor is significant at the level of 0.05. A total correlation value of 0.32 or above for the item shows that each item has internal validity, i.e. characteristic that is wanted to be measured with the factor can be measured by the item (Büyükoztürk, 2017).

4 items constituting the first factor of the Brigance Kindergarten Form are under the title of "*Academic Skills*", 5 items constituting the second factor are under the title of "*Language and Communication Skills*" and 3 items constituting the third factor are under the title of "*Motor Skills*". A total of 12 items constitute Brigance Kindergarten Form.

Analyses based on the three factors concerning the reliability of the form and Cronbach Alpha internal consistency coefficients of the items determined related to the general form are also shown in Table 3. Accordingly, the reliability coefficient of the first factor, *Academic Skills* factor is calculated to be 0.72, the reliability coefficient of the second factor, *Language and Communication Skills* factor is calculated to be 0.66, the reliability coefficient of third factor, *Motor Skills* factors is calculated to be 0.62, and the reliability coefficient of general form is calculated to be 0.79. Özdamar (1999) states that the Cronbach Alpha reliability value is considered to have an acceptable level of reliability in the range of 0.60-0.80; a high level of reliability in the range of 0.80-0.90 and a very high level of reliability in the range of 0.90-1.00.

When the sub-factors and the reliability coefficients of the general form are examined, it is concluded that they have an acceptable level of reliability.

CONCLUSION AND SUGGESTIONS

Conclusion

"Brigance Kindergarten and First-Grade Screening II Test Kindergarten Form" consists of three factors and 12 items. It is valid and reliable.

Suggestions

1. "Brigance Kindergarten Form" can be used by kindergarten teachers and parents to assess roughly the development of children, aged 5.
2. Researchers may use this tool to determine roughly the level of development, developmental retardation, and fast-developing children in their studies related to age group.
3. Schools may use the form for curricular arrangements for kindergarten children aged 5.

In this section, findings, discussions and conclusions about the application phase of the research are included.

Practice Study

After the validity and reliability analysis of the Brigance K&I screen II kindergarten form, the new education period was re-applied in the schools determined to determine the developmental levels of five children. The Working Group was formed from schools located in districts with different socio-economic characteristics in Ordu province. The number of schools and children in 7 different schools and 6 different neighborhoods is given in Table 4.

Table 4 Schools Working in Practice

Name of School	Application Date - Semester and Number of Children
	2017 -2018 Fall
Private Kindergarten	39
Government Kindergarten	45
Government Kindergarten	60
Government Primary School Nursery Class	21
Government Primary School Nursery Class (2 Class)	42
Government Primary School Nursery Class	20
Government Primary School Nursery Class (2 Class)	35
Total	262

Application Process and Evaluation

The scanning process in the application study was carried out using the same procedures and conditions as in the validity - reliability study. Scanning has begun after the necessary permits and preliminary negotiations. Usually a full day private kindergartens in Turkey, the state kindergarten and kindergarten classes are half-day to make the dual training. The study included five-year-old children in both morning and afternoon groups. Screening was conducted in parallel with private schools and state schools. Children were assessed as group and individual according to the test guideline. After the screening is completed, the total scores are calculated by scoring the answers and performances in accordance with the test's scoring guidelines. According to the ranking of the total scores children were grouped as upper (79 and above), average (65-78) and below the average (0-64). According to the explanations in the brigance technical report, average sub-groups were identified as "normal development limit", "risk group" and which should be monitored due to developmental delay. Part of the risk group has been identified as "what needs to be directed for detailed evaluation". These grouping and the total score of each child in the table are listed and interpreted. Some of the screening evaluations of the working group were also grouped and tabled as a state preschool, a private pre-school and a state kindergarten to examine the distribution in small groups.

The screening test was applied at the beginning of the academic year. Findings and discussions with comments were made based on the total scores of these rough evaluations.

It is requested that the level of development of the children school administration and the teacher and the children with special needs who are diagnosed are not told to the researcher before the application. At each school where the study was conducted, the performance of the child and the observations on the screening line immediately after the screening for each child were shared with the teacher. The information obtained from the teacher also constituted the idea that the scan was accurate and incisive. Children with special needs and diagnosed children showed poor performance in screening tests, and the characteristics of the area being diagnosed were also determined by screening (attention deficit, hyperactivity, autism, mental retardation, learning disability, etc.). Children with normal development are noted and shared with the teacher during the screening process for the strengths and weaknesses that need to be supported. In the same way, the development of children who are at a higher level is also roughly defined and supported. At the same time, if there is a normal development and / or skill or development area to be supported, it is suggested again. The children under the middle of the development were also recommended to guide the detailed

evaluation for the children who need the special education support, how the class in the class will support the level of the skills and development they are forced or left behind for each of them. It has also been suggested for situations in which the family should participate. Some of the children shared specific information about their behavior and attitudes to them during the test. This information was shared with the school's manager and classroom teacher and suggestions about the situation were made. The parents were interviewed with the parents who wanted to get information about their children's development and special situation, and they were referred to the appropriate language with a screening evaluation and made recommendations. At the beginning of the screening process, many families reported that they wanted to get information about the end result of the scan through the teacher. The points to be communicated to the family when the scan evaluation grades are shared with the teacher are mentioned in particular.

Findings to the Application Study

In this section, the whole working group is evaluated and grouped over the total points. Table 5, The total scores and groupings of the Study Group's screening evaluations are ranking. In addition, a state kindergarten (Table 6), a state primary school (Table 7) and a special kindergarten (Table 8) were included in the study group in order to show the different numbers of small group assessments of the test according to the total scores of the test.

because the development of the test might be at risk. When Table 5 was evaluated, it was the 4,5% slice of the 12 children group in the upper group. The total scores of these children are 91-79. According to the evaluation of the test score ranges, the children in the upper group should be included in further evaluations in terms of superior ability/superior Intelligence.

In the average group, 62 children with normal development constitute 24% of the whole group. Children in the normal developing group received a total score of 77-65. Children in this group are children with typical development and the evaluation process is positive.

Below the average group were evaluated in three subgroups: those at the normal developmental limitations, those who need to be monitored due to developmental delay, and those who are at the risk group. Children under normal score range should be monitored, supported and intervened.

In the Normal Development Limit, 119 children constitute 45% of the study group. The total score of this group is 64 - 44. The scores of the children in this group show that their development should be monitored periodically, even if they are not at an alarming level.

Table 5 Brigance K & 1 Screen II Kindergarten Form Screening Evaluations Total Scores Ranking and Grouping

Upper Group		Average Group				Below the Average Group								Risk Group(52 Child20% Slices)					
Advanced Development 12 Children 4,5% Slices		Normal Developing 62 children % 24 Slices				Normal Development Limit 119 children 45% Slice								** Wh. Nd. to be Mnt. Due to Devlp. Dly. 17 Children 6,5% Slices.		25 children 9.5% Slices		Detailed Value 27 Children 10.5% Slices	
S.N	*Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc
1.	91	1	77	32.	70	1.	64	31	61	61	55	91	48	1.	43	1.	40	26.	32
.	88	.	77	.	70	.	64	.	61	.	55	.	48	.	43	.	40	.	32
.	86	.	77	.	70	.	64	.	60	.	55	.	48	.	43	.	39	.	32
.	86	.	77	.	70	.	64	.	60	.	55	.	48	.	43	.	39	.	32
.	85	.	76	.	70	.	64	.	60	.	55	.	48	.	43	.	39	30.	32
.	82	.	76	.	70	.	64	.	60	.	55	.	48	.	43	.	38	.	31
.	82	.	75	.	69	.	64	.	60	.	54	97	48	.	43	.	38	.	31
.	81	.	75	.	69	.	63	.	60	.	54	.	47	.	43	.	38	.	30
.	80	.	75	40.	69	.	63	.	60	.	53	.	47	.	43	.	38	.	30
10.	79	10	75	.	69	10.	63	40	60	70	53	100	47	10.	42	10.	37	.	30
.	79	.	74	.	68	.	63	.	60	.	53	.	47	.	42	.	37	.	30
12	79	.	74	.	68	.	63	.	60	.	53	.	47	.	42	.	37	.	28
.	.	.	74	.	68	.	63	.	60	.	53	.	46	.	42	.	37	.	27
.	.	.	74	.	68	.	63	.	59	.	53	.	46	.	42	.	37	.	27
.	.	.	74	.	68	.	62	.	59	.	53	.	46	.	42	.	36	40.	27
.	.	.	74	.	68	.	62	.	58	.	53	.	46	.	42	.	36	.	25
.	.	.	74	48.	67	.	62	.	58	.	52	.	46	17.	42	.	35	.	24
.	.	.	73	49.	67	.	62	48.	58	.	52	.	45	.	.	.	35	.	24
.	.	.	73	50	67	.	62	49.	57	.	51	.	45	.	.	.	34	.	23
.	.	20	73	.	67	20.	62	50.	57	80	51	110	45	.	45	20.	34	.	23
.	.	.	73	.	67	.	62	.	57	.	50	.	45	.	45	.	34	.	22
.	.	.	73	.	66	.	61	.	57	.	50	.	45	.	45	.	34	.	21
.	.	.	72	.	66	.	61	.	57	.	50	.	45	.	45	.	33	.	20
.	.	24	72	.	66	24.	61	.	57	.	50	.	45	.	45	.	33	.	19
.	.	.	72	.	66	25.	61	.	57	.	49	.	45	.	45	25.	33	50.	18
.	.	.	71	.	66	.	61	.	57	.	49	.	45	.	45	.	.	52.	17
.	.	.	71	.	66	.	61	.	56	.	49	.	44	.	44	.	.	.	17
.	.	.	71	.	66	.	61	.	56	.	48	.	44	.	44	.	.	.	17
.	.	.	71	60.	65	.	61	.	56	89	48	119	44	.	.	.	.	.	17
30.	71	.	65	30.	61	60	56	90	48	.	.	.	.	.	.	.	.	.	17
31.	71	62.	65	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17

General Total : 262

* Brigance. **17% Of Children Who Need To Be Monitored Due To Developmental Delay

Table 5 gives the total scores of the screening evaluations of the children in the study group (n=262).

Scores are generally grouped as upper, average and lower, and percentiles are calculated. Subgroups were formed according to the limit scores determined by below the average groups test

17 children with a total score of 43 - 42 constitute 6,5% of the study group. Children in this group should be evaluated more frequently than others.

52 children in the risk group were included in the 20% slice. Total scores of 24 children in 9.5% of these children are

between 40 and 33. 28 children in the 10.5% slice in the risk group are in the range of points to be guided for detailed evaluation. The total scores of these children are between 32 and 17. According to the grading and evaluation of the test, 20% of the screening group is in the risk group. According to the score range (32 and lower), 10.5% should be directed to the detailed assessment for specific training needs in any or more areas. In Table 6, The total scores and grouping of the screening evaluations of 45 children attending a state kindergarten in the Working Group were given.

9 (20%) children were included in the risk group. Among these, 5 children (11%) with a total score of 30 -17 require guidance for detailed evaluation. Children in the risk group are children who may need educational measures in an area requiring special education. The reasons why the total scores of the children in this group are low should be investigated carefully and the children should be directed to more detailed evaluation with the children in the second part of the group in terms of the need for special education.

Table 6 Brigance K & 1 Screen II Kindergarten Form Screening Reviews State Kindergarten Total Scores Ranking and Grouping

Upper group		Average grup				Below the average group						Risk Group(9 Child20% Slices)							
Advanced Development 2 child,4% Slices		Normal Developing 12 children % 27 Slices				Normal Development Limit 19 children 42% Slices						Developmental Delay 3 Children %7 Slices				4 Children %9Detailed Assesment Slices 5 Child % 11			
S.N	*Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N	Brgnc	S.N.	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc		
1.	89	1.	75	7.	68	1.	64	7.	59	13.	53	1.	43	1.	37	1.	30		
2.	80	.	74	.	67	.	64	.	59	.	51	.	42	.	37	.	30		
		.	73	.	66	.	63	.	58	.	49	3.	41	.	36	.	25		
		.	73	.	66	.	63	.	58	.	48			4.	33	.	22		
		.	72	.	66	.	62	.	57	.	47					5.	17		
		6	71	12.	66	6.	61	12.	56	.	47								
									19.		45								
General Total : 45																			

* Brigance

Table 6 gives the distribution of the scores of 45 children attending the state nursery in the study group. Points listed in accordance with the test's grouping Directive According to this, the total scores of the two children in the upper Group (4%) are 89-80. According to the score range of the test, these two children should be evaluated in detail in terms of developing further than their peers or having a high intelligence and special ability.

The total scores of 12 children (27%) in the average group are between 79 and 66. The total score range of 19 children (42%) The development of children in this group is normal. It can be considered as a positive situation in terms of general development.

In Below the Average Group within the normal developmental limit is 64-45. Although the development of children in this group is not worrying, they should be closely monitored by being evaluated more frequently than the normal Developing Group. This approach is important in terms of providing the necessary intervention and educational support in a timely and adequate manner. The total score of 3 children (6.5%) who need to be monitored for developmental delay is between 43 and 41. The children in this group should be monitored by providing the additional educational support they need and by evaluating them at Frequent intervals.

In Table 7, The total scores and grouping of the screening evaluations of 21 children attending kindergarten in a state primary school in the Working Group were given Table 7 shows the distribution of scores of 21 children in the Working Group who continue their primary school in the state primary school. Accordingly, 85 points (5%) and 1 child were included in the upper group. This group's highest score should be evaluated in detail in terms of development and academic/art/sports in a higher level than their peers. The total scores of 5 children (43%) in the average group are between 79 and 67. Children in this group are in normal developmental language except for special situations in a particular area.

In Below the Average Group, 9 (23%) in the Normal Development Limit total score is between 61-45. These children are developing close to normal according to the screening score. However, the development process should be closely monitored. The total score of 2 children (9.5%) who need to be monitored for developmental delay is between 43-41. Children in this range of points should be closely monitored through screening evaluations and observations more frequently in terms of developmental delay. 4 (20%) children were included in the risk group. Among these, 3 children (%) have a total score of 40-34. 1 child who requires guidance for detailed evaluation has received a total

Table 7 Brigance K&1 Screen II Kindergarten Form Screening Reviews Total Scores and Grouping of Primary School Kindergarten

Upper Group		Average grup				Below the average group						Risk Group (4Children 20% Slices)			
Advanced Development 1 Child 5 % Slices		Normal Developing 5 Children %24 Slices				Normal Development Limit 9 Children 43 % Slices						Developmental Delay 2 Child % 9 3 çocuk %15 Detailed Assesment 1 Child % 5			
S.N	Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc
1.	85	1.	79	1.	61	6.	48	1.	43	1.	40	1.	24		
		.	77	.	57	.	46	2.	41	.	35				
		.	73	.	52	.	45			3.	34				
		.	68	.	51	9.	45								
		5.	67	5	48										
Genel Toplam: 21															

of 24 points. Children in the risk group should be directed to a detailed assessment in terms of special education support.

In Table 8, The total scores and of the screening evaluations of 39 children and the groups were given from a private kindergarten in the Working Group.

As a result of the study, 13% (n = 55) of 408 children were found to be talented or academically talented. The Glascoe study suggests that the Brigance test is highly susceptible (82%) in identifying gifted and academically gifted children. Educators increasingly accept the benefit of early recognition and intervention programs for preschool and

Table 8 Brigance K & 1 Screen II Kindergarten Form Screening Reviews Private Kindergarten Total Scores and Grouping

Upper Group		Average Group				Below the Average Group				Risk Group					
Advanced Development 1 child, 2,5 % Slices		Normal Developing 14 children % 36 Slices				Normal Development Limit 12 children 30,5 % Slices				Developmental Delay 5 Children 13 % Slices		2 Children 5%		Advanced Assessment 5 Children 13%	
S.N	Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N.	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc	S.N	Brgnc
1.	86	1.	77	8	71	1.	64	7	55	1.	43	1.	36,90	1.	30
		.	76	.	71	.	63	.	53	.	43	2.	36,45	.	28
		.	76	10.	68	.	63	.	53	.	43	.		.	24
		.	74	.	68	.	61	.	52	.	39	.		.	22,5
		5.	74	.	67	.	60	.	50	5.	39	.		5	19,5
		.	72	.	65	6	58	12.	47						
		7	72	14.	65										
GeneralTotal : 39															

In Table 8, The total scores range and grouping of the screening evaluations of 39 children attending a special kindergarten were given in the Study Group. The rating of the scores listed in accordance with the grouping directive of the test is as follows:

According to this, there were 86 points in the upper group and 1 child (2,5%). This child should be evaluated in detail in terms of superior ability/superior intelligence and advanced academic ability. The total scores of the "normal developing" 14 children (36 %) in the average group are between 77 and 65. This group, which is progressing normally, has a positive development trajectory.

The total score range of 12 children (30.5%) in the group under the average is accepted as "Normal Development Limit" is between 64-47.

The development of these children should be closely monitored through more frequent evaluation and observation. The total scores of 5 children (13%) who need to be monitored for developmental delay are between 43-39.

The risk of delayed development should be assessed in terms of the educational support needs of the children in this group. 7 children representing 18% of the group are in the risk group. Among these, 5 children (13%) require guidance for detailed evaluation with a total score of 30 -19,5. The risk group should be included in further assessments for special education interventions without delay and without any follow-up.

DISCUSSION AND CONCLUSION

When assessed in Table 5, the percentage of children in the upper slice according to the Brigance Kindergarten Form is very close to the rate of representation of this group in the literature. The proportion of fast developing children was 2% in a randomly assigned group. To reach two gifted / talented children, 100 children should be screened or assessed. Considering that the sample size of the study was 262, Brigance provided a close determination of the detailed assessment tools (4.5%). Glascoe (1996), Brigance Early Preschool, Preschool, and K & 1 Screens, 408 (21 and 84 months of age) children with multicultural backgrounds of American society have used gifted and scholarly gifted talent to measure the effectiveness of identifying possible children.

kindergarten pupils, who have a high potential or ability at an extraordinary level, which is another special needs group. Educational intervention and further evaluation following screening assessments will ensure that the talents and potentials of the children in this group are properly assessed and their needs are met.

According to the total score of the screening evaluations, the average score of 6 (2%) of the children in the normal developing group is very close to the score of the children in the upper group. This ratio constitutes 6.5% of the Working Group. In an approach he calls the talent pool of Renzulli and Renzulli(2010), he also includes students who are out of group with very small percentages of tests in one group.

According to Borland, J. H., and Wright, L. (1994), scales used in the diagnostic process of high-ability and high-potency children should be valid and reliable. In the nature of diagnosis, the child's problems, weaknesses and needs as well as strengths, potential and abilities should be determined.

Brigance allows researchers to determine the performance and potential of each field in which the child is roughly evaluated. If the child has demonstrated poor performance in the area of physical skills that lower his / her total score, this should be taken into account in the evaluation of academic development.

According to the total score, the score of 3/2 of 62 children in the normal developmental range is at the top of the slice. That is to say, it is important to keep in mind the possibility that children with normal development may be talented and creative children in their group. In his research with Brigance (1996), Glasgow (1996) indicated that the test was high in specificity in determining normal developing children (73%). Antepi and Yildiz (2015), 134 infants and children (10-60 months) evaluated the development of 13 children between 48-60 months in their survey with Denver II as normal.

Nearly 40% of the 119 children who were in the normal developmental limit in below the average group remained out of their normal developmental range with small point differences. Considering that the scan is done at the beginning of the semester, the situation may be better or even return to normal with the evaluation being repeated in the middle or end of the period. For this reason, children who are in the range of

points at the normal developmental level should be watched closely. The second group in below the average range of points is the child group to be "monitored due to developmental delay". These children, which cover 6.5% (17 children) of the study group, should be re-evaluated more frequently, such as Mid-term and end-term, due to the need for intervention and support education. You can also use the more detailed evaluation option. Brigance is widely used in the United States to place students in more than 700,000 schools annually, to determine the curriculum to be applied, or to decide that further testing is needed to detect possible barriers to the child. Another result of Antepi and Yıldız (2015)'s research with 134 children mentioned above is that a total of 35 children development has been considered as a suspect.

Children in the risk group, representing 20% of the sample, are the group that needs to be assessed in more detail without losing time. Depending on the total score of the screening test, early age and appropriate intervention methods should be acted on. According to Rydz (2005) and colleagues, about 5 to 10% of the children's population have a developmental delay. Mackrid, and Ryherd (2011); According to Sands and Friends (2005), there is at least one developmental delay in 12-16% of children in American society. Half of the children who are still not diagnosed until they start the kindergarten are affected by the backwardness in at least one developmental area. Late detection of developmental delay may ineffective the benefits of early intervention. Ellia and *et al.* (2017), conducted the children's developmental screens with questionnaires filled by 1012 children's mothers between the ages of 24-60 months. As a result of the study, the developmental delay prevalence rate of the study group was determined as 3.4%. The most common temporary diagnoses are learning related problems (32.3%) and language disorders (29.4%).

The range of the total scores in screening assessments is similar for children attending state preschool (table 6), kindergarten/nursery class (table 7) and private preschool (table 8). In other words, in the groups included in the scan, the prevalence (% slices) determined as upper, middle and lower group are parallel to each other. There was no obvious difference between the screening total scores of the mentioned schools.

As a result, the screening process and evaluations made with the Brigance K & I Screen II Kindergarten Form revealed that children with 5 years of age development and special education needs were correctly identified and provided early awareness of early intervention.

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