

DEVELOPMENT OF A SCALE ON PRIMARY SCHOOL TEACHERS'
KNOWLEDGE AND PERCEPTION OF DYSLEXIA

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DEVELOPMENT OF A SCALE ON PRIMARY SCHOOL TEACHERS'
KNOWLEDGE AND PERCEPTION OF DYSLEXIA

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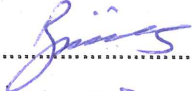
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ABSTRACT

Development of a Scale on Primary School Teachers' Knowledge and Perception of Dyslexia

The aim of the present study is two-fold. Firstly, it attempts to develop a scale to measure primary school teachers' knowledge and perception of dyslexia. Secondly, it aims to explore teachers' knowledge and perception of dyslexia through this scale. This study examines whether teachers' knowledge and perception of dyslexia differ with regard to years of teaching experience, taking a course or seminars related to dyslexia, reading a book or an article about dyslexia and teaching a student with dyslexia or not. For this purpose Teachers' Knowledge and Perceptions Scale was developed and 201 primary school teachers participated in the study. The results showed that there was no significant relationship between primary school teachers' knowledge of dyslexia and their teaching experience. Also their knowledge of dyslexia did not differ with regard to other variables of the study. On the other hand, there was a weak positive relationship between teachers' perception of dyslexia and teaching experience and there was a significant difference between perceptions of primary school teachers with regard to taking a course about dyslexia during university education. Teachers' perception did not differ with regard to taking an in-service seminar, reading a book or an article and teaching a student with dyslexia. The study may contribute to dyslexia research in terms of developing a scale to measure teachers' knowledge and perception of dyslexia and revealing their knowledge and perception.

ÖZET

İlkokul Öğretmenlerinin Disleksi Bilgisi ve Algısı Üzerine Ölçek Geliştirme

Bu çalışmanın amacı ilkokul öğretmenlerinin disleksi hakkındaki bilgilerini ve algılarını ölçen bir ölçek geliştirmek ve bu ölçekle ilkokul öğretmenlerinin disleksi bilgilerini ve algılarını araştırmaktır. Benzer şekilde bilgilerinin ve algılarının tecrübe, disleksi hakkında ders alma, hizmet içi seminer alma, disleksi hakkında kitap veya makale okuma ve disleksisi olan bir öğrenciye eğitim verme değişkenlerine göre farklılaşıp farklılaşmadığı da incelenmiştir. Bu amaçla Öğretmen Bilgi ve Algı ölçeği geliştirilmiş ve 201 ilkokul öğretmeni araştırmaya katılmıştır. Sonuçlar öğretmenlerin disleksi hakkındaki bilgileri ile tecrübeleri arasında bir ilişkinin olmadığını göstermiştir. Öğretmenlerin bilgileri araştırmanın diğer değişkenlerine göre de değişmemektedir. Bununla birlikte öğretmenlerin disleksi algıları ile tecrübeleri arasında zayıf düzeyde pozitif yönlü bir ilişki bulunmuştur. Öğretmenlerin disleksi algıları disleksi hakkında üniversite sürecinde ders alıp almama durumuna göre de farklılaşmaktadır. Ancak öğretmenlerin disleksi algıları arasında hizmetçi eğitim alma, disleksi hakkında kitap ya da makale okuma ve disleksisi olan bir öğrenciye sahip olma durumlarına göre anlamlı bir fark bulunmamıştır. Bu çalışma disleksi araştırmalarına öğretmenlerin disleksi bilgisi ve algılarını ölçmeyi amaçlayan bir ölçek geliştirmesi ve öğretmenlerin bilgilerini ve algılarını ortaya çıkarması açısından katkıda bulunabilir.

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Dedicated to my beloved husband, Barış Tosun,
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CHAPTER 1

INTRODUCTION

Reading is one of the basic skills that every individual needs to acquire in order to function in the society. Most of the daily routines depend on reading ability, hence reading becomes much more important. Reading does not only help individuals to function in the society but also it enhances mental development (Ministry of Education, 2009). Therefore, reading ability is the first and also the most important ability that the students need to acquire during their first years of schooling.

Reading is a complicated process during which the reader should achieve several tasks at the same time. It does not only include reading the words, but also includes comprehending the meanings of the words (Miller & Schwanenflugel, 2006). Besides, it also requires to match visual symbols to sound units (Ziegler & Goswami, 2005). In order to match visual symbols to sound units, both psychomotor skills and cognitive skills should work together. Reading occurs at the end of this process (Demirel, 2004). On the other hand, for some students, those who suffer from dyslexia, this process is much more difficult than their peers. Despite their adequate intelligence and intellectual abilities, students with dyslexia acquire reading with much more difficulty compared to their peers.

Dyslexia is a language based learning difficulty that affects word reading, spelling, writing and other language related tasks (Vellutino, Fletcher, Snowling, & Scanlon, 2004). Learning to read is the primary goal for the first years of schooling and students acquire reading skills through a systematic literacy education which mostly depends on language based activities offered by teachers. Teachers are the most important figures who play a significant role in reading acquisition. A well-

qualified teacher is crucial for every student when they start to learn reading. Furthermore, teachers have a much more important role for students who suffer from dyslexia. Research has shown that with the help of the teacher who provides appropriate reading instruction, students with dyslexia can increase their probability of success (Snow, Burns, & Griffin, 1998).

A knowledgeable teacher is also the key point for early identification and intervention of a student with dyslexia. Early intervention is crucial for students with dyslexia because a student who reads poorly in the first grade will continue to read poorly through fourth grade if he or she is not identified earlier (Torgesen et al., 1999). In other words, non- recognition or delayed help redouble the problem (Wadlington & Wadlington, 2005) and this problem may continue throughout their life span. Students who cannot develop adequate reading skills in the first years of schooling are more likely to become unsuccessful in the following years (Akyol, 2006). Being academically unsuccessful causes frustration, low self-esteem, behavioral problems, it may even cause dropping out school. Due to the reasons mentioned, it is vital to identify students with dyslexia and provide professional support for them. In order to identify dyslexic students and provide appropriate reading instruction for them, teachers need to have an accurate understanding of dyslexia (Shaywitz, 2003). Therefore, it is essential to explore the teachers' knowledge about dyslexia.

Students' reading achievement is affected by their teachers' knowledge and capabilities (Lane et al., 2009), especially the achievement of students with dyslexia (Mills, 2006). To improve these reading achievement both for students who have dyslexia and for those who does not have, teachers' self-confidence has a significant effect on dyslexic students. According to Tschannen- Moran and Wolfok-Hoy

(2001), there is a significant connection between teachers' self-confidence and students' self-confidence. Teachers who have a high degree of self-confidence are more likely to try new methods to meet the needs of dyslexic students. Teachers need to have adequate knowledge of dyslexia in order to meet the needs of students with dyslexia.

Besides teachers' knowledge of dyslexia, their perception of dyslexia has an important effect on students with dyslexia. It is known that in addition to knowledge, teachers' perception of dyslexia also affects the capability of dealing with dyslexia. For a teacher who has a negative perception related to dyslexia, it is clear that he or she will have the same perception with the dyslexic student as well and as a result he or she will tend to rate the achievements of dyslexic students as low (Hornstra, Denessen, Bakker, van den Bergh, & Voeten, 2010). Negative perception of dyslexia causes teachers to decrease their expectations from dyslexic students and they develop a negative perception of dyslexic students. Negative perceptions of dyslexic students affect dyslexic students' achievement negatively. On the contrary, teachers with positive perceptions of dyslexia are more likely to assist students with dyslexia (Hornstra et al., 2010).

Teacher's perception is affected by their knowledge of dyslexia. According to Avramidis, Bayliss, and Burden (2000a) teachers' perception of dyslexia is shaped by their knowledge gained through their education. Research shows that teachers need additional education about dyslexia in order to meet the needs of dyslexic students (Washburn, Binks-Cantrell, & Joshi, 2014). If teachers do not have adequate knowledge and positive perception of dyslexia, it is mostly because of the inadequate education they had during their university period or insufficient in-service training opportunities about dyslexia. Research has shown that teachers do not receive

necessary education during their teacher preparation program to teach students with dyslexia (Moreau, 2014; Polat, Adigüzel, & Akgun, 2012) and they complain about being deprived of support to assist dyslexic students and having inadequate knowledge about dyslexia (Polat et al., 2012).

As being one of the common learning disabilities, dyslexia has become a challenge for teachers also. Dyslexia is a learning disability which is neurological in origin and it is related to cognitive abilities (Lyon, Shaywitz, & Shaywitz, 2003). These cognitive abilities become extremely important when the children start to school and become much more sensible. For this point, the first years of school are crucial to recognize learning disabilities such as dyslexia. Dyslexic students start to show symptoms of dyslexia when they start the reading activities. Although the severity of it changes depending on the student, dyslexic students show similar symptoms such as poor spelling, decoding abilities and influent word recognition (Lyon et al., 2003). Teachers should be aware of these symptoms in order to recognize and help students with dyslexia.

Research has shown that teachers have common misconceptions about dyslexia (Bos, Mather, Dickson, Podhajski, & Chard, 2001). A common misconception about dyslexia is that letter or word reversal is common to all dyslexic students (Wadlington & Wadlington, 2005). Vision problems are seen as the source of dyslexia and every student with a vision deficit is thought to have dyslexia (Bell, McPhillips, & Doveston, 2011). Lenses are thought to help dyslexic students (Washburn, Joshi, & Binks- Cantrell, 2011a). Also all the dyslexic students are thought to have same characteristics with similar symptoms and similar severity (Wadlington & Wadlington, 2005). These are the misunderstandings about dyslexia showing that most of the teachers lack accurate knowledge of dyslexia and it is

impossible to assist a student with dyslexia without having a correct understanding about the nature and symptoms of dyslexia. Another misconception about dyslexia is that dyslexia can be cured with medicine (Shaywitz, Morris, & Shaywitz, 2008). These studies show that teachers lack the accurate knowledge of dyslexia in order to identify dyslexic students and support them.

It is important to note that every teacher can confront a student who has dyslexia, so every teacher should equip himself or herself with the accurate knowledge and positive perception of dyslexia in order to meet the needs of dyslexic students. The knowledge and perception of dyslexia are the source of teachers' abilities to teach students with dyslexia (Gwernan-Jones & Burden, 2010).

1.1 The purpose of the study

Primarily the aim of the present study is to develop and validate a scale measuring primary school teachers' knowledge and perception of dyslexia and secondly to explore primary school teachers' knowledge and perception of dyslexia through this scale. The factors that predict teachers' knowledge and perception of dyslexia were also examined.

Factor analysis technique, correlational analysis and group comparisons were used in the study. Specifically exploratory factor analysis was used to identify the number of the constructs and to develop the scale. Correlational analysis and group comparisons were used to answer research questions.

1.2 Significance of the study

With the expanding research base on education, teachers' knowledge of dyslexia have attracted researchers' attention. Teachers play a significant role for identification and inclusion of students with dyslexia, so having accurate knowledge of dyslexia is an obligation. Since insufficient knowledge and negative perception of dyslexia may have significant role in the under-identification and treatment of dyslexic students, it is important to develop a scale to measure primary school teachers' knowledge and perception of dyslexia and to explore what they really know about dyslexia and what are their perceptions of dyslexia. There are many studies about teachers' knowledge related to dyslexia (Ferrer, Bengoa, & Joshi, 2016; Schatschneider & Torgesen, 2004; Washburn, Mulcahy, Musante, & Joshi, 2017). Knowledge of dyslexia provides successful data for diagnosis of dyslexia.

Another issue, namely teachers' perception, is what researchers are interested in about the subject. Most of the research on the field is focused on teachers' perception of dyslexia (Bos et al., 2001; Pedersen & Liu, 2003; Stipek, Giwin, Salmon, & MacGyvers, 2001). Teachers' knowledge and perception affect dyslexic students' self-confidence and performance. Therefore, it is important to develop a scale on primary school teachers' knowledge and perception of dyslexia and to explore primary school teachers' knowledge and perception of dyslexia. This study contributes to the growing body of research focusing on teachers' knowledge and perception of dyslexia. Also the results of this study may have significant implications for the diagnosis of students with dyslexia and teacher education.

CHAPTER 2

LITERATURE REVIEW

This chapter includes four parts. Firstly, a detailed explanation of dyslexia is covered. Secondly, teacher education about dyslexia is explained. The third part is about identification of dyslexia in Turkish educational system. The fourth part handles teachers' knowledge and perception of dyslexia according to research in the literature.

2.1 Dyslexia

Dyslexia is one of the common learning disabilities encountered in children during school years. For this reason, it has been studied by researchers for many years. Researchers have conducted many studies about dyslexia and defined it in many different ways. Some researchers focused on the causes of dyslexia and defined it as a neurological disorder with genetic effects (Shaywitz, 2003). Another definition included inner and environmental factors such as intelligence, motivation and reading instruction as the causes of dyslexia. Dyslexia is defined as an unexpected reading difficulty in children who are intelligent enough, and motivated and exposed to reading instruction (Shaywitz & Shaywitz, 2008). The most accepted definition of dyslexia includes causes, characteristics of dyslexia and defines it in relation with language components.

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge. (Lyon et al., 2003, p:2)

Dyslexia is also described as a neurobiological disorder that impacts an individual's ability to decode, read and write a written language and communicate verbally (Brown, 2015). As can be understood from the definitions, dyslexia is a learning difficulty related to language and affects individuals' whole lives.

Although dyslexia definitions vary, dyslexia shows similar symptoms among different languages (Goswami, 2010) and these symptoms are important to recognize dyslexia. Some of these symptoms can be listed as difficulty in decoding words, reading slowly and inaccurately, mixing letters and words, and suffering from poor verbal memory (Shaywitz, 2003). Dyslexia is a common learning difficulty which has influences on different areas. Dyslexic students suffer from different problems in an educational environment. These problems may be related to reading and writing, cognitive and sensory motor abilities.

It is reported that 80% of the students who need special education suffers from dyslexia (National Center for Statistics, 2008). The International Dyslexia Association stated that 15-20% of the general population are thought to have one or more symptoms of dyslexia (International Dyslexia Association, 2007). In China and Japan 1% of the students have dyslexia whereas 33% of the students from Venezuela have dyslexia. Dyslexia has a 10% prevalence rate in England (Doğan, 2012). According to Bingöl (2003) 2% of the school aged students have dyslexia in Turkey.

The orthography of the language is seen as the potential cause of the difference between the prevalence of dyslexia. The prevalence of dyslexia is lower in the languages with transparent orthographies than the languages with opaque languages (Wydell, 2012).

2.2 Teacher education about dyslexia

A qualified teacher is the significant factor in literacy education. Without a knowledgeable teacher neither instruction strategies nor intervention helps dyslexic students in the way of becoming a good reader. Studies have shown that a student who had problems in reading at the third grade still continues to have trouble with reading throughout his school life (Lyon, 1998). In addition, these children have trouble with comprehension and obtaining conceptual knowledge throughout their lives (Torgesen, Wagner, & Rashotte, 1994). In order to prevent such problems that affect the whole life, literacy acquisition should be done through effective and specialized approaches by a well-trained teacher (Brady & Moats, 1997). Therefore, it won't be an exaggeration to mention again the fact that teacher education is invaluable during all these processes.

In order to assist students to improve their reading skills and access content curriculum, all teachers should be aware of the effective literacy instructional strategies (Boling & Evans, 2008). Teachers should have a high level of reading instruction knowledge for teaching students in an effective way because their choice of instructional and intervention programing is affected by their knowledge (Foorman & Moats, 2004). Also students' reading skills increase in direct proportion with the teachers' knowledge of best reading strategies. In other words more knowledgeable teachers facilitate reading achievement of students compared to those who have less knowledge about the issue (Spear- Swerling & Brucker, 2004).

It is a commonly accepted phenomenon that teachers need to be well-prepared and well-trained in order to meet the needs of all students especially the students with dyslexia. Soodak and Podell (1994) reported that teachers who were not prepared adequately for literacy instruction, showed a tendency to direct dyslexic

students to special education teachers. These teachers were observed as having lack of the knowledge of explicit instruction strategies. On the contrary, teachers who were aware of explicit instruction felt prepared to teach dyslexic students. The preparation stage for a teacher should begin during the university education process and all the teachers should have compulsory dyslexia courses during their university education. In addition to this, in-service training about dyslexia should be provided for teachers (Soodak & Podell, 1994).

It is possible to see that courses about special education are compulsory in some countries whereas in some countries such as Turkey it is elective. Bachelor Degree programs do not include a special course about dyslexia in Turkey. A course about special education including dyslexia is given in some of the Bachelor Degree programs and graduate programs. Since teachers do not have the opportunity to enhance their knowledge about dyslexia, most of the teachers need to attend an in-service training in order to be prepared to teach students with dyslexia. MEB provides teachers the opportunity to take in-service training about special education and dyslexia (MEB, 2009). Also non-government organizations plan in-service training about special education called as “Özel Öğrenme Güçlüğü Eğitimcilerinin Eğitimi” and “Özel Öğrenme Güçlüğü Eğitimciliği” (Özkardeş, 2012). However, it is obvious that these small percentage of training programs are not sufficient to provide teachers with the necessary knowledge and ability to teach dyslexic students (Lovett et al., 2008). Studies have shown that teachers have more positive attitudes towards dyslexic students if they take a course about dyslexia during their university education period (Chong, Forlin, & Au, 2007). Hence university programs, both under-graduate and graduate programs, need to include special courses about dyslexia.

Aypay (2009) conducted a study with 228 teachers graduated from faculty of education. The aim of the study was to determine the effectiveness of the teacher training program of faculty of education on the basis of teachers' responses. The study investigated the effectiveness of the program from different aspects which were supporting different learning styles, program design and teaching, teaching and learning to provide guidance, professional development and establishing a productive classroom environment. Gender served as a sub-dimension and no significant difference was found between the female and male teachers' responses. The teachers thought that the teacher training program provided them different learning styles. Supporting different learning style sub-dimension had the highest score. The sub-dimension of "program design and teaching" and "teaching and learning" to provide guidance were ranked equally and had the second highest score. Teachers' responses to the questions related to the professional development sub-dimension had the third highest score. The last sub-dimension which was establishing a productive classroom environment had the lowest score. In other words, teachers did not feel well prepared for creating a productive classroom environment. The sub-dimensions which were highly ranked were related to content knowledge that the teacher training program included. However, the last sub-dimension was related to applying the content knowledge to the classroom practices. These results showed that although teacher training program supported teachers with content knowledge, it was not satisfactory enough in applying this knowledge to classroom activities.

Another study related to teacher education was conducted by Higher Education Council (YÖK, 2007). The study evaluated teacher training program according to faculty members' responses. Faculty members and students, program, area of expertise, materials were some of the sub-dimensions. Related to the students,

faculty members thought that the students did not chime with the European Union standards. Also teachers were seen as inadequate in using information technologies. Most of faculty members thought that the teachers were not qualified well. Faculty members also suffered from lack of material deficiency related to the program.

Sever, Tarım, Ültay, and Çilingir (2018) in their study called as “A research on required courses in primary education program” evaluated primary education program based on the courses. They compared the compulsory courses included in different programs with different faculties of education. They reported that the compulsory courses of programs were different from each other. It is understood that universities were not in cooperation so the courses did not share a common feature. Moreover, most of the courses focused on content knowledge. This means that the teacher training programs did not offer courses for teachers which allow them to apply what they know. Another important characteristics of the programs was that they did not offer courses which help teachers to develop their psychomotor skills.

Polat et al. (2012) designed a study in order to support dyslexic students with their web-based learning system. They reported that they need to prepare such a system because there is no education system for dyslexic students in Turkey and they are lacking of face to face counseling. The study included five subject area experts, 15 parents and six primary teachers. Both participants responded to the semi-structured questions about the needs of dyslexic students. The results highlighted the inadequacy of the “Turkish Ministry of Education Specific Learning Disabilities Support Education Program”. Also it was found that teachers suffered from lack of knowledge and training about dyslexia, intervention techniques for dyslexic students because they did not receive adequate training about dyslexia.

These studies revealed that teachers suffer from lack of essential knowledge and training about dyslexia and they seek further support in order to be adequately prepared to meet the needs of the students with dyslexia. In order to provide teachers with knowledge and support they need, MEB conducted some projects and planned in-service training in cooperation with universities such as, Lifelong Learning Program, Foreign Language Education for the students who suffer from Dyslexia.

Offering training to all teachers about dyslexia is an important factor for the success students with dyslexia since training about dyslexia provides teachers knowledge. Studies have shown that students with dyslexia feel high level of stress if their teacher lacks awareness of dyslexia (Karande, Mahajan, & Kulkarni, 2009). Also, it is known that knowledge and perception of teachers have a strong effect on their instruction (Stipek et al., 2001). These studies revealed the importance of teachers' knowledge and perception of dyslexia. Teachers' knowledge and perception of dyslexia are important because it is reported that more knowledgeable teachers support students who have difficulties in reading compared to less knowledgeable teachers.

2.3. Identification of dyslexia in Turkish educational system

Most of the European countries observe and evaluate children starting from early childhood or preschool period with regard to dyslexia (Vural & Yücesoy, 2004). However, in Turkey dyslexia is generally recognized in the second or third grade of primary school (Doğan, 2012). During these processes, teachers have always been the main figures for recognizing dyslexia and also education part of dyslexia is a major issue for the teachers. One of the main responsibility of a teacher during this process is to observe the student deeply and at the same time to be aware of dyslexia.

On the point of recognizing that the student shows the symptoms of dyslexia, the first step to be done is to direct the student to the psychological counseling and guidance unit of the school. The next step would be observation and evaluation of the student by the psychological counselor of the school and directing the student to child psychiatrist. After the student is observed and tested in the hospital, a report related to dyslexia is written. The student applies counseling unit and starts to take special education services. This service generally includes inclusive education. The student is educated in the same classroom with his or her typical peers. At this point, the teacher is the key figure for a dyslexic student in an inclusive classroom. With this significant role a teacher should have accurate dyslexia knowledge to assist dyslexic students. Therefore, teachers' knowledge and perception of dyslexia are significant and the following part is about teachers' knowledge and perception of dyslexia.

2.4 Teachers' knowledge and perception of dyslexia

Teachers are the most important members of an education team for all the students but especially for the students who suffer from dyslexia. Because what teachers know about dyslexia and how they perceive dyslexic students direct their identification of the students and supporting activities for these students. Teachers' beliefs and perception affect the decisions and actions they make and take in the class, so students' learning is also affected by teachers' beliefs and perception (Pedersen & Liu, 2003).

The way the teacher perceives the student with dyslexia affects how the student perceives himself/ herself. If the teacher has a negative attitude towards the student then the student has a negative attitude towards himself, for example he may have a low self-confidence. This situation has significant impacts both on academic

and social achievement of the child. (Wadlington & Wadlington, 2005). This situation can also cause snow-ball effect. At the beginning, low scores on the tests cause a feeling of shame but continuing low scores can cause depression and anxiety. Low expectations of teachers cause dyslexic students to perceive themselves as unsuccessful because of the fact that teacher expectations and student achievement show direct relationship (Paterson, 2007).

Negative attitudes of teachers also affect the time duration in which they help these students in writing activities. Also teachers rate dyslexic students' writing abilities as low. Instruction style and curricular opportunities are also affected negatively if the teacher has a negative attitude towards the disability (Hornstra et al., 2010). Dyslexic students have limited opportunities to participate in activities and answer the questions asked by the teacher because of teachers' negative attitudes (Gwernan & Burden 2010).

It is seen that teachers have negative attitudes towards students with dyslexia and they give different reasons for this. One possible reason is not to have sufficient motivation to obtain necessary knowledge about dyslexia. Teachers can find it difficult to access sources of knowledge such as in-service training about dyslexia. Another point is teachers have the responsibility to meet the needs of all students in their class including dyslexics which they see as an extra challenge. They may see dyslexic children as an extra burden so they have a negative attitude towards them. Also most of the teachers do not accept parents as reliable sources about their children and do not want to share any information about children's inability with the parents and ignore dyslexia (Gwernan & Burden 2010).

The school atmosphere also plays an important role in teachers' knowledge and perception of dyslexic students. If the school administration does not provide

teacher the opportunities or adequate support to meet the needs of the dyslexic students, the teacher becomes demotivated (Wadlington & Wadlington, 2005). Teacher training programs, prior experiences, social and cultural pressure, also have impacts on teachers' knowledge and perceptions of dyslexia (Beijaard, Meijer, & Verloop, 2004).

2.4.1 Studies from different countries related to teacher's knowledge and perception Teachers are significantly important factors for dyslexic students, therefore teachers' knowledge and perception of dyslexia have been studied by researchers all over the world.

Bell et al. (2011) investigated current teachers' and teaching assistants' descriptions of dyslexia and the factors influencing their descriptions. Also how far they link this inability to cognitive processing was evaluated. 57 participants from England and 72 participants from Ireland participated in the study. This was a comparative study and the data were collected through questionnaire surveys. The findings of the study showed that teachers used the discrepancy model to identify students with dyslexia. The discrepancy model is a model in which dyslexic students are identified according to the difference between their cognitive ability and academic achievement. This is a model which disregards environmental factors and no longer in use. Researchers also highlighted the importance of understanding the nature of dyslexia. In order to evaluate new tools and programs, teachers need to have a clear understanding of nature of dyslexia and theoretical framework.

In the study conducted by Moreau (2014) high school teachers were interviewed in order to examine their perception of dyslexic students. The interviews had questions about teachers' understanding about dyslexia, their competence in

teaching dyslexic students, behaviors of dyslexic students and influences of dyslexia on the dyslexic students. Most of the teachers mentioned about the problems related to decoding and comprehension abilities of dyslexic students. On the other hand, they stated that they had difficulty in diagnosing dyslexic students. An interesting result of the study was that high school teachers didn't feel responsible from reading abilities of dyslexic students. According to these teachers, the cause of reading disability was out of their control and they did not have enough time to improve reading skills of dyslexic students.

In their study Washburn et al. (2011a) investigated teachers' knowledge of basic language components and dyslexia. Kindergarten through grade five, 185 teachers including experienced and beginning teachers, from two different parts of United States participated in the study. The data were gathered through a survey which developed in order to measure both teachers' knowledge of basic language components and knowledge and perception of dyslexia. The results revealed that both experienced and beginning teachers evaluated their teaching ability as moderate and they accepted dyslexia as a visual deficit rather than a phonological deficit which was a misunderstanding. This misunderstanding prevented teachers to provide dyslexic students with the relevant support in order to enhance their reading abilities.

Ferrer, Bengoa, Joshi (2016) conducted a study aimed to investigate in-service and pre-service teachers' knowledge and beliefs about developmental dyslexia. Spanish speaking teachers from two different countries, Spanish and Peru, participated in the study. The teachers completed a scale about their knowledge and beliefs about dyslexia. The scale included three subscales which measured knowledge about symptoms and diagnosis of dyslexia, knowledge about treatment of dyslexia and general knowledge about dyslexia. In-service teachers performed better

than preservice teachers on the subscales of general information, and symptoms and diagnosis subscale. Preservice teachers' scores were low both in three subscales and they had misconceptions. Also it was seen that in-service teachers' knowledge of dyslexia was affected by the factors such as post training about dyslexia, years of teaching experience, prior exposure to a dyslexic student, and high self-esteem.

Washburn and colleagues (2017) conducted an exploratory study with 271 undergraduate and graduate teachers in order to investigate novice teachers' knowledge about characteristics of learning disabilities and dyslexia. Certification type, certification grade level and exposure to reading content served as independent variables of the study. Questions about features of dyslexia and learning disabilities were asked to the participants. Both quantitative and qualitative methods were used in data analysis procedure. The findings showed that teachers had a clear understanding of learning disabilities whereas they had misunderstandings about dyslexia. Their knowledge about learning disabilities and dyslexia were not dependent on certification type, certification grade level and exposure to reading content. On the other hand, misunderstandings about dyslexia were predicted by certification grade level.

This part of the study presented studies about teachers' knowledge and perception from different parts of the world. Next part presents studies conducted in Turkey related to teachers' knowledge and perception.

2.4.2 Studies from Turkey related to teachers' knowledge and perception

Dyslexia studies have been conducted for many years in Turkey. Bingöl (2003) developed a survey to help teachers in diagnosing students with developmental dyslexia. 25 primary teachers participated in the study. The teachers were given a

questionnaire which included 46 items, which related to developmental dyslexia and ADHD. The teachers were asked to diagnose the dyslexic students in their classrooms. The study made it apparent that teachers were confused about the terms dyslexia and attention deficit hyperactivity disorder. Also teachers reported that they had not heard the term developmental dyslexia before. The problems of dyslexic students were seen to be associated with psychological, visual or auditory problems by the teachers. In other words, psychological problems, visual and auditory problems were seen as responsible for the problems of dyslexic students. The teachers also revealed that the parents were not in cooperation with them so they felt desperate. Some of the teachers from high socio economic parts of Ankara stated that they did not have enough time to deal with dyslexic children and support them with different activities because they need to meet the needs of the majority of the classroom. Some of the teachers were against inclusive education and thought that dyslexic students should be educated in special needs education classrooms.

İzci (2005) conducted a study with 132 pre-service teachers which taught fourth grade students from Gaziantep University primary education department. The main purpose of the study was to examine the knowledge of special needs education of pre-service teachers. The results showed that teachers were not interested in special needs education. Moreover, they had negative thoughts about inclusive education since they did not have adequate training to support learners with learning disabilities. Also high class attendance was a problem for teachers and they reported that it should be decreased. Primary school teachers' abilities about inclusive education and knowledge about special needs education were not adequate enough to help students with special needs. İzci concluded that primary school teacher education programs should include courses about special needs education.

The relation between primary teachers' knowledge of learning disabilities and their attitudes toward inclusive education was studied by Yiğiter (2005). The sample was comprised of 164 primary teachers who answered 15 items about learning disabilities. The researcher examined whether the knowledge of learning disabilities change based on the gender, age, training about learning disabilities, the area of profession, the number of the students in the class and perceptions about their qualification. It was seen that teachers' knowledge varies on the basis of these components. It was reported that teachers' attitudes towards inclusive education differ according to being familiarized with someone with learning disability and their beliefs about their qualification. On the other hand, there was no significant relation between teachers' knowledge of learning disabilities and their attitudes towards inclusive education.

Another study was conducted by Altuntaş (2010). The target of the study was to capture primary teachers' knowledge about dyslexia and their intervention techniques for dyslexic students. It was seen that having a dyslexic student and type of the school they work in were not related to teachers' knowledge of dyslexia. Teachers had an insufficient knowledge level of dyslexia and did not feel well prepared to teach dyslexic students.

A qualitative study was conducted by Altun, Ekiz, and Odabaşı (2011) about reading difficulties. The study aimed to explore reading difficulties that primary teachers encountered in their classrooms and their solutions for these difficulties. Semi- structured interviews were used in data gathering process and the interviews were analyzed through content analysis. Results of the study indicated that every teacher faced with reading disabilities in their classrooms. The most common disability among students was to read slowly. The teachers were asked about the

cause of this reading disability and most of the responses were related to inadequate reading practices and parental irrelevance. Also the effects of reading disabilities were questioned. Most of the teachers had the belief that students with reading disability had a low-self-esteem and their comprehension was not good. Then the teachers were questioned about what they did to overcome these difficulties and effects. Most of the teachers revealed that they awarded students when they read correct. The second popular response was planning a reading hour during the school day. Teachers perceived themselves as insufficient in the area of reading disability. It was asked to the teachers who should help them. Most of them valued parental support as the most important factor and reported that a training seminar can be given to the parents. The study showed that teachers didn't believe in themselves in teaching students with reading disabilities.

Koç (2012) investigated the intervention practices of 100 primary teachers for students with learning disabilities. The study captured the intervention practices of teachers. Most of the teachers mentioned that they offered one to one settings for these students. Also they emphasized the importance of peer support. Successful learners help students with learning disabilities in order to enhance their abilities. Teachers also used different instructional strategies for their special needs students. They were also in contact with the parents of these students. All the practices have positive effects on students with learning disabilities.

Another study was aimed to measure both primary teachers' and Turkish language teachers' knowledge about reading difficulties and their ability of identifying students with reading disabilities. Doğan (2013) conducted a mixed method study with 24 primary teachers and 24 Turkish teachers from Kilis with a total sample of 48 teachers. An achievement test was developed by the researcher

and questions about the definition, symptoms and treatment of reading disabilities were asked to the teachers. An open ended interview form was also used for eight teachers to measure the ability to diagnose students with reading disabilities. The results showed that although none of the teachers answered all the questions correctly, the reading disability knowledge level of Turkish teachers was higher than primary school teachers' level. Also Turkish language teachers' abilities to identify students with reading disabilities were higher than primary teachers which was a noteworthy result. One of the primary school teachers who had 15 years teaching experience mentioned that he had never had a student with reading disability throughout his teaching experience. On the other hand, primary school teachers perceived themselves more adequate to overcome reading disabilities than Turkish language teachers. Another important finding of the study was that novice teachers were much more knowledgeable about reading disabilities than experienced teachers. In other words teaching experience was not a significant factor in assessing teachers' knowledge about learning disabilities.

Akçay (2014) designed a study to determine elementary school teachers' awareness about dyslexic students from grade one to grade four. The researcher developed a Likert type scale. Also open ended questions were asked to the sample which was comprised of 104 elementary school teachers. Gender, teaching experience, type of certification, type of faculty, the grade of students they teach, their beliefs about their qualification, taking an in-service training, the class size were the variables of the study. The findings revealed that the elementary school teachers' awareness level of dyslexia didn't change according to the variables investigated in this study.

A contradictory study was conducted by Yurdakal (2014). The study was a mixed study designed to investigate primary school teachers' perception of activities for their dyslexic students and the factors which their activities were based on. Teachers' knowledge level of dyslexia was also measured. Also teachers were questioned in order to reveal their perception about activities they chose in the class, classroom arrangement, and problems of dyslexic students. The study included 359 primary school teachers from grade one, two, three and four. The findings indicated that teachers' knowledge level of dyslexia was adequate. For their high level of classroom perception, gender, experience and class were served as significant factors. On the other hand, age and faculty type did not cause any difference between their perception.

These studies have confirmed that teachers' knowledge and perception of dyslexia varied. Some of the teachers had accurate knowledge and positive perception of dyslexia whereas some of the teachers had misconceptions and negative perception of dyslexia. Also this line of research has shown that teachers are lack of support to meet the needs of dyslexic students. It is important to note that dyslexic students need well-qualified teachers and teachers need support. It is obvious that studies about teachers' knowledge and perception of dyslexia contribute to the success of both teachers and dyslexic students because inaccurate knowledge and negative perception of dyslexia may cause under-identification of students with dyslexia.

Studies revealed that knowledge and perception of dyslexia is significantly important for the identification and treatment of dyslexia therefore it is important for teachers to have accurate knowledge and positive perception of dyslexia. On the other hand, conflicting results have emerged from research on teachers' knowledge

and perception of dyslexia due to using different instruments and further research is needed to resolve contradictory findings. The present study attempts to develop a scale on primary school teachers' knowledge and perception of dyslexia and to explore teachers' knowledge and perception of dyslexia through this scale. The next chapter is about methodology of the present study.

CHAPTER 3

METHODOLOGY

This part of the study consists of five sections: research design, sample, scale development, procedure, and data analysis. In the beginning, the research questions and hypothesis with the research design of the present study are introduced. Secondly, details about the sample are covered. Third part includes scale development procedure. Then the data collection procedure is presented and finally the data analysis procedure is mentioned.

3.1 Research questions and hypothesis

The primary purpose of the study was to develop a scale to measure primary school teachers' knowledge and perception of dyslexia. In addition the study examined primary school teachers' knowledge and perception of dyslexia through this scale. Besides teachers' knowledge and perception, variables that can predict primary school teachers' knowledge and perception of dyslexia were also examined.

The study was guided by following main research questions and sub- questions:

Research question 1: What do primary school teachers know about dyslexia?

Sub- research question 1: Is there a significant relationship between teachers' teaching experience and their knowledge of dyslexia?

Sub-research question 2: Is there a significant difference between primary school teachers' knowledge with regard to

- a) taking or not taking a course about dyslexia during university education?
- b) taking or not taking an in-service seminar about dyslexia?
- c) reading or not reading a book or an article about dyslexia?
- d) teaching or not teaching a student with dyslexia?

Research question 2: What are primary school teachers' perception of dyslexia?

Sub-research question 3: Is there a significant relationship between primary school teachers' teaching experience and their perception of dyslexia?

Sub-research question 4: Is there a significant difference between primary school teachers' perception with regard to

- a) taking or not taking a course about dyslexia during university education?
- b) taking or not taking an in-service seminar about dyslexia?
- c) reading or not reading a book or an article about dyslexia?
- d) teaching or not teaching a student with dyslexia?

Research question 3: What are primary school teachers' perception of dyslexic students' classroom behaviors?

Sub-question 5: Is there a significant relationship between primary school teachers' teaching experience and their perception of dyslexic students' classroom behaviors?

Sub-question 6: Is there a significant difference between primary school teachers' perception of dyslexic students' classroom behaviors with regard to

- a) taking or not taking a course about dyslexia during university education?
- b) taking or not taking an in-service seminar about dyslexia?
- c) reading or not reading a book or an article about dyslexia

d) teaching or not teaching a student with dyslexia

There are 15 null hypothesis that were tested in the present study.

H₀₁: There is no significant relationship between teachers' teaching experience and their knowledge of dyslexia.

H₀₂: There is no significant difference between teachers' knowledge of dyslexia with regard to taking a course about dyslexia during university education.

H₀₃: There is no significant difference between teachers' knowledge of dyslexia with regard to taking an in-service seminar about dyslexia.

H₀₄: There is no significant difference between teachers' knowledge of dyslexia with regard to reading a book or an article about dyslexia.

H₀₅: There is no significant difference between teachers' knowledge of dyslexia with regard to teaching a student with dyslexia.

H₀₆: There is no significant relationship between teachers' teaching experience and their perception of dyslexia.

H₀₇: There is no significant difference between teachers' perception of dyslexia with regard to taking a course about dyslexia during university education.

H₀₈: There is no significant difference between teachers' perception of dyslexia with regard to taking an in-service seminar about dyslexia.

H₀₉: There is no significant difference between teachers' perception of dyslexia with regard to reading a book or an article about dyslexia

H₀₁₀: There is no significant difference between teachers' perception of dyslexia with regard to teaching a student with dyslexia.

H₀11: There is no significant relationship between teachers' perception of dyslexic students' classroom behaviors and their teaching experiences.

H₀12: There is no significant difference between teachers' perception of dyslexic students' classroom behaviors with regard to taking a course about dyslexia during university education.

H₀13: There is no significant difference between teachers' perception of dyslexic students' classroom behaviors with regard to taking an in-service seminar about dyslexia.

H₀14: There is no significant difference between teachers' perception of dyslexic students' classroom behaviors with regard to reading a book or an article about dyslexia

H₀15: There is no significant difference between teachers' perception of dyslexic students' classroom behaviors with regard to teaching a student with dyslexia.

3. 2 Research design

In order to answer these questions and test the hypotheses, a cross sectional survey research method was used in the present study. Cross sectional survey research is used to explore people's opinions on a special issue. In this research design the data is gathered through a survey and the survey is administered to the sample only once (Gay, Mills, & Airasian, 2012). This kind of study helps to find out "what is the situation". By this method it is also possible to collect data that describes characteristics of a large sample group of individuals rapidly. That's why cross sectional survey research is one of the methods widely used in educational studies.

Since the current study was aimed to find out primary school teachers' knowledge of dyslexia and primary school teachers' perception of dyslexia, cross sectional survey design was chosen as the most appropriate design for the current study.

3.3 Sample

The participants of the study were primary school teachers. The term primary school teachers refers to the teachers who teach the students from first grade to fourth grade. These teachers who teach from first grade to fourth are the ones who have a significant role in students' academic lives. That's why the target variable of the study is primary school teachers' knowledge and perception of dyslexia.

In the sample primary school teachers who taught students from a district which is in south-east part of İstanbul for the second semesters of the year 2017-2018 and 2018-2019 were chosen as the participants. In the aforementioned district people from different socio- economic status live and there are 38 public primary schools in this part of the city. The study included teachers from 17 different public primary schools which were selected through convenience sampling. 201 primary teachers, all of whom were voluntary to participate in the study, were chosen to take part in this current study.

The study included 145 female teachers who formed 72.1 percentage of the sample and 56 male teachers who composed 27.9 percentage of the sample. Table 1 displays the descriptive statistics of participants' teaching experience. Teaching experiences of teachers ranged from 1 to 23 years. The mean of the teaching experience was 11.01, the median was 10.00, and the standard deviation was 5.67.

Table 1. Descriptive Statistics of Teaching Experience

	N	Minimum	Maximum	Mean	Median	Std. Deviation
Teaching Experience	201	1	23	11.01	10.00	5.67

Table 2 represents frequency distributions of teachers' gender, education level, type of graduated faculty, hearing the term dyslexia, taking a course about dyslexia, taking an in-service seminar about dyslexia, reading a book or an article about dyslexia, teaching a student with dyslexia, having sufficient academic knowledge to teach a student with dyslexia.

According to Table 2, 19.4% of the teachers stated that they have never heard the term dyslexia. The 87.1% of the teachers did not take a course about dyslexia during their university education. Most of the teachers (93.5%) have not taken an in-service training about dyslexia yet. Vast majority of them (75.6%) have not read a book or an article about dyslexia. Majority of the teachers (70.1%) have not teach a student with dyslexia and most of the them (82.6%) thought that they have inadequate academic knowledge to teach a student with dyslexia.

Table 2. Frequency Distributions of Sample

		Frequency	Percent
Gender	Female	145	72.1
	Male	56	27.9
Education Level	Two years of Degree	11	5.5
	Bachelor Degree	179	89.1
	Master Degree	11	5.5
Type of Faculty	Education Faculty	169	84.1
	Other Faculties	32	15.9
Heard about Dyslexia Before	Yes	162	80.6
	No	39	19.4
Taking a course	Yes	26	12.9
	No	175	87.1
In- service Training	Yes	13	6.5
	No	188	93.5
Reading a Book or an Article	Yes	49	24.4
	No	152	75.6
Teaching a Student with Dyslexia	Yes	60	29.9
	No	141	70.1
Have Sufficient Academic Knowledge	Yes	35	17.4
	No	166	82.6

3.4 Instruments

One of the aims of the study was to develop a scale to measure primary school teachers' knowledge and perception of dyslexia. For that reason, Teachers' Knowledge and Perception scale was developed.

3.4.1 Development of a scale

Scales are manifestation of latent constructs such as knowledge and perception which cannot be measured directly (DeVellis, 2012). Scales are generally used to capture attitude, behavior, knowledge, belief or an action which cannot be captured in a single item. In other words scales aim to measure not directly observable latent concepts with a group of concrete statements. Also researchers are not able to observe the direct relationship among variables, but it is possible to determine if they are sufficiently intercorrelated with one another (DeVellis, 2012). There are three phases which include 10 steps in scale development (DeVellis, 2012).

3.4.2 Steps in scale development

The first phase in a scale development is item development (Haynes, Richard, & Kubany, 1995). Item development includes identification of domains, item generation, and content validity. The first step is to articulate the domains. A domain refers to the concept that is the target of the study and a well-defined domain provides a working data about the latent constructs that are under study. Also a well-defined domain specifies the boundaries of the domain and eases the process of item generation and content validation. As the second step a detailed literature review should be done and a pool of item should be formed according to literature review.

This process is called as item generation. In item generation the forms of the items and the wording of the items should be taken into consideration. Items should capture real experiences of the target population and should be worded simply. Also a table of specification should be formed to ensure alignment between the items of the scale and the constructs that the scale intends to assess. The third step is to check content validity. Content validity measures if the items measure what they are presumed to measure. Content validity is mainly assessed through evaluation by expert and target population judges.

The second phase is scale development. Before the survey is actually administered the items should be pre-tested for the fourth step. Pre-testing has two components: the examination of the extent to which the items reflect the domain being studied and the examination of the extent to which answers to the items asked produce valid measurements. After pre-testing the items, the scale should be administered. The fifth step is to determine the sample size. The necessary sample size depends on the study including the level of variation between the variables and the level of over-determination of factors. It is suggested to have at least 10 participants for each scale item (Nunnally, 1978). However Clarke and Watson (1995) suggested sample sizes that are independent of the number of survey items. A range of 200 - 300 participants is recommended as appropriate (Clarke & Watson, 1995). Larger sample size implies lower measurement errors and stable factor loadings, replicable factors and generalizable results (Osborne & Costello, 2004). However sample size is constrained by resources available. After required sample size is defined, item reduction analysis is conducted to ensure that only functional and internally consistent items are included (Field, 2009). The primary goal of this sixth step is to obtain items that are highly correlated with each other, discriminate

between individual cases and contribute significantly to the construct. The next step is to conduct exploratory factor analysis to understand the latent structure of a set of items and the extent to which the relationships between the items are internally consistent (Field, 2009). This is done by extracting latent factors which represent the shared variance in responses among the multiple items. To determine the number of factors to retain scree plot technique and factor loadings are used (Field, 2009). It is often recommended to retain items that have factor loadings of .40 and above (Pedhazur & Schmelkins, 1991). Also items with cross-loadings or that appear not to load uniquely on individual factors should be deleted (Pedhazur & Schmelkins, 1991).

The last phase includes test of dimensionality, test of reliability and test of validity. For the eighth step dimensionality of the scale should be determined. Test of dimensionality determines whether the measurement of items, their factors and function are the same across two independent samples or within the same sample at two different points of time (Field, 2009). After the dimensionality of the scale is tested, for the ninth step reliability of the scale should be tested. A number of standard statistics have been developed to test reliability of a scale including Cronbach's Alpha, test-retest reliability, split half estimates, Spearman Brown formula. Of these statistics Cronbach's Alpha is predominantly used to assess the reliability of a scale (Field, 2009). Cronbach's Alpha has been the most common reliability test which assesses the internal consistency of the scale items, the degree to which the set of items in the scale co-vary, relative to their sum-score (Field, 2009). An alpha coefficient of 0.70 has been regarded as an acceptable threshold for reliability and Cronbach's alpha of .80 indicates a good value and .90 indicates an excellent value (Field, 2009). The tenth step is to test the validity of the scale. Scale

validity is the extent to which an instrument indeed measures the latent construct it was developed to evaluate. It is an ongoing process that starts with the identification of the domain of study and continues to its generalizability with other constructs. Content validity is done prior to the instrument being administered to the target population, and concurrent criterion and construct validity are evaluated after survey administration. Criterion validity is the degree to which there is a relationship between a given test score and performance on another measure of particular relevance, referred as criterion. Concurrent criterion validity is the extent to which test scores have a stronger relationship with criterion measurement made at the time of test administration or shortly afterward. A limitation of concurrent validity is that this strategy for validity does not work with small sample sizes because of their large sampling errors. Secondly, appropriate criterion variables or “gold standards” may not be available. Construct validity is the extent to which an instrument assesses a construct of concern and is associated with evidence that measures other constructs in that domain and measures specific real world criteria. Three indicators of construct validity are relevant to scale development: convergent validity, discriminant validity, differentiation by known groups. Convergent validity is the extent to which a construct measured in different ways yields similar results. Discriminant validity is the extent to which a measure is novel and not simply a reflection of some other construct. Differentiation or comparison between known groups examines the distribution of a newly developed scale score over known binary items (Field, 2009).

3.4.3 Development of teachers' knowledge and perception scale

The scale was developed to measure two dimensions: teachers' knowledge of dyslexia and teachers' perception of dyslexia. The scale includes 28 items focused on knowledge of dyslexia and 28 items related to perception of dyslexia. The items were organized randomly. Table 3 represents categories of the scale and related item numbers and Appendix A includes teachers' knowledge and perception scale.

Table 3. Table of Specification

Assessed Target Area	Related Item Numbers
Knowledge of Dyslexia	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 32, 33, 36, 37, 42, 43, 47, 49, 52, 53, 55
Perceptions of Dyslexia	10, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 34, 35, 38, 39, 40, 41, 44, 45, 46, 48, 50, 51, 54, 56

Items related to knowledge of dyslexia are statements that are focused on the goals what a dyslexic student can achieve and cannot achieve. For example, the items 'A student with dyslexia experiences difficulties in remembering the seasons and months in order' and 'A student with dyslexia needs to read the same paragraph again and again' are items related to knowledge of dyslexia. Items measuring teachers' perception of dyslexia includes both pedagogical statements and statements about general knowledge of dyslexia. For example, 'Dyslexia is a disease' and 'A student with dyslexia' should not receive education with other students' are items related to perception sub-scale.

Demographic questions related to gender, years of teaching experience, education level, type of the faculty they graduated from were also asked to teachers. Moreover, this part of the scale aims to get further data about teachers' personal knowledge related to dyslexia and includes seven yes- no questions related to dyslexia. 'Did you take a course about dyslexia during your university education' and 'Have you ever taken an in-service seminar about dyslexia' are the examples of yes- no questions (Appendix A).

The scale includes a 5 point Likert Type questionnaire about dyslexia. The questionnaire part includes 56 items about dyslexia and teachers were asked to measure the items with the numbers between 1 and 5 according to their agreement level. Number 1 means strongly disagree, number 2 means disagree, number 3 means neither agree nor disagree, number 4 means agree and number 5 means strongly agree.

Prior to developing the scale, a detailed literature review was done. Items which were taught as related to teachers' knowledge of dyslexia and their perception of dyslexia were chosen for the scale and a scale was formed with 56 items. The questionnaire includes items that are adapted from other questionnaires and that are used in other dyslexia studies (Akçay, 2014; Yurdakal, 2014) and items that are created by the researcher according to experts' suggestions. For the next step, the questionnaire was applied to 30 teachers in order to control the adequacy of the scale. Of these 30 teachers 19 were female teachers and 11 were male teachers. All of the teachers were from public schools. The scale was investigated in terms of language and clarity and it was re-shaped according to the feedbacks of these 30 teachers and researcher group's suggestions. In the plot scale the yes- no question of the demographic part which is 'Do you think that you have sufficient academic

knowledge to teach a student with dyslexia?’ was not included. This question was added to the scale according to experts suggestion and the scale had the final version.

3.5 Data collection procedure

The questionnaire was applied to the teachers in the spring semesters of 2017-2018 and 2018-2019 academic years and the data gathering process continued from March to May. The researcher visited schools many times in order to reach teachers. Only the available teachers answered the questionnaire. Before the questionnaire were applied, the school administration was informed about the study and the test. The researcher introduced herself both to the teachers and to school administration. The aim of the study and participants’ rights were explained to the teachers.

All the teachers took the test in their free times during the school day. Most of the teachers completed the test in teachers’ room. During the application process of the test, the researcher was nearby the teachers in order to prevent communication with other teachers and affect each other. Every teacher answered the test according to their own knowledge and perceptions under standard conditions. It took about 35 minutes to complete the test for a teacher.

3.6 Data analysis

Since the aim of the study was to discover primary school teachers’ knowledge and perception of dyslexia, both descriptive and inferential statistics were used to analyze the data.

As the first step, “Teachers’ Knowledge and Perception Scale” was developed to measure teachers’ knowledge and perception. As the second step exploratory factor analysis was conducted and the reliability of the scale was measured. According to the results of the exploratory factor analysis teachers’ knowledge and perception scores were calculated and these scores were used to conduct correlational analysis and comparing groups in order to answer research questions.

For the descriptive part frequencies, means, medians, modes and standard deviations were calculated and histograms were used in order to depict the data. Next part of the study explains the reasons of using these statistical tests and includes information about them.

3.6.1 Exploratory factor analysis

Exploratory factor analysis is used for the purpose of identifying underlying variables within a set of variables. It is a technique used to lower the number of the variables when the data set includes several related variables. In other words, it is an analysis technique used to lower the dimensionality of the data set. Factor analysis provides a summary of the large amount of the data by investigating the relationships between the variables. It is a data reduction technique especially for the social sciences which generally aims to measure variables that cannot be directly observed (Field, 2009).

The present study aimed to measure teacher’s knowledge and perception which are variables that have several facets and cannot be directly observed. Factor analysis helps to find out whether several facets do reflect a single underlying variable. This underlying variable is called as factor. Every factor is shaped by

measuring the relation between the variables and grouping highly correlated variables together (Fabrigar & Wegener, 2012). In the present study, the data was gathered through a survey developed by the researcher and included large amounts of items intended to measure primary teachers' knowledge and perception of dyslexia. Factor analysis was used to explore the data and to reduce the large amount of the data set. Since knowledge and perception are the variables which cannot be observed directly, factor analysis helped to measure these variables. The following parts of the study give details about exploratory factor analysis.

An important point about factor analysis is type of variance. The total variance has two subtypes: unique variance and common variance. Unique variance is also called as random variance because it is not reliable and specific to one measure. In exploratory factor analysis the common variance is important. Some of the common variance is shared and used accounted for common factors. The factor analysis with the principal axis represents only the common variance. The proportion of common variance is called as communality. Communality has a value between 0 and 1. The purpose of the factor analysis is to find common latent facets within the data. That's why factor analysis deals with only the common variance (Field, 2009).

Exploratory factor analysis includes important stages. These stages are: Bartlett's test, controlling the sample size, factor extraction, factor rotation, factor loadings and factor naming. The following part explains these stages.

3.6.1.1 Bartlett's test

The first step in factor analysis is to control whether the variables are correlated or not. Because highly correlated variables are more likely to form common factors.

The correlation between variables are tested by forming correlation matrix. Bartlett's test is used to interpret the correlation matrix. The Bartlett's test should be significant and it is significant if the correlations between variables are different from zero (Field, 2009).

3.6.1.2 Sample size

The second step before conducting a factor analysis is to control the sample size. Sample size is an important factor for the reliability of the factor analysis. Kaiser-Meyer-Olkin measure is the mostly used technique for controlling sample size. The KMO value changes between 0 and 1 (Kaiser, 1970). If the KMO value is 0, it is inappropriate to run a factor analysis. The values close to 1 mean that the sample size is large enough to get meaningful results from factor analysis. Values greater than 0.5 are acceptable. Values between 0.5 and 0.7 are mediocre, between 0.7 and 0.8 are good, between 0.8 and 0.9 are great and between 0.9 and 1 are superb (Hutcheson & Sofroniou, 1999).

3.6.1.3 Factor extraction

Extraction is used to decide how many factors will be included in the analysis. It is important to choose the factors which are statistically important because it is meaningless to retain all factors. There are different techniques to determine the importance of the factors. Using eigenvalue of a factor is one of these techniques. Factors with large eigenvalues should retain. According to Kaiser (1960) an eigenvalue of 1 shows an adequate amount of variation so the factors with eigenvalues greater than 1 should remain.

Another extraction technique is scree plot technique. It is used to determine if an eigenvalue is large enough to indicate a significant factor. A graph of each eigenvalue (y axis) against the factor with which it is associated (x axis) is used in order to find out relative importance of factors. In this technique factors are selected according to the sharp descent in the curve. In other words, the point of inflexion is used to determine the factors. The factors which are on the left side of the inflexion point are remained and the factors on the right side of the inflexion point are ignored. The scree plot works effectively when the sample size is more than 200 (Stevens, 2002).

3.6.1.4 Factor rotation

Factor rotation is another issue to deal with in exploratory factor analysis. In order to get much more meaningful factors and to differentiate, factor rotation is needed. There are two rotation methods; they are orthogonal rotation and oblique rotation. Orthogonal rotation is used when the factors are not correlated. On the other hand, oblique rotation is used for correlated factors. Orthogonal rotation technique is used most commonly than the oblique rotation because it is much more difficult to interpret oblique rotation. Orthogonal rotation has different methods such as varimax, quartimax and equamax. In this study varimax method is used to rotate the factors as varimax method attempts to load a smaller number of variables highly onto each factor. By this way, it offers much more interpretable groups of factors.

3.6.1.5 Factor loadings

The correlation between a variable and a factor is symbolized by factor loadings. It is used to determine which variables are in relation with which factors. The sample size is important to determine the factor loadings. Some researchers accept the value of more than 0.30 as the meaningful factor loading (Stevens, 2002). On the other hand, some researchers recommend to use the value of 0.40 as a meaningful factor loading (Pedhazur & Schmelkin, 1991). Factor loadings are important in order to decide which factors and items will remain.

3.6.1.6 Factor naming

Factor naming depends on factor loadings. Items which are loaded on the same factor are accepted as related. Hence they are named based on a common facet shared between them.

3.6.2 Reliability

Reliability means that the instrument should render the construct and it should measure whether an instrument produces the same results under the same conditions. In other words, a person is expected to get consistent results from a reliable questionnaire if he or she completes the questionnaire at different times. The most common measure of reliability is Cronbach's Alpha. Cronbach's Alpha investigates whether the items of the questionnaire are related to each other or not. The reliability of the test is shown with a value between 0 and 1. The value should be at least .70 for

being accepted as a reliable questionnaire. Cronbach's alpha of .80 indicates a good value and .90 indicates an excellent value (Field, 2009).

3.6.3 Correlational analysis

Sub-research questions 1, 3 and 5 examine the relationship between primary school teachers' teaching experience and their knowledge and perception of dyslexia. Both variables are interval variables; that's why the relationship between them was analyzed through Pearson's Product Moment correlational analysis. The following parts of the study explain correlational analysis.

The relationship between variables are analyzed through correlational analysis. If there is a relationship between variables, changes in one variable could be related to changes in the other variable. Correlational analysis has two types; they are bivariate and partial correlation. The correlation between two variables is a bivariate correlation. On the other hand, partial correlation is the relationship between two variables while controlling the effect of additional variables. Pearson's Product Moment correlation and Spearman's rho correlation are sub-types of bivariate correlation. In the present study Pearson's Product Moment was used. The data should be interval for the analysis of Pearson's Product Moment (Field, 2009).

With the correlational analysis the hypothesis that the correlation is different from zero is tested. Two variables which are positively and totally correlated have a coefficient of +1. This means that as one variable increases, the other variable increases also. On the other hand, two variables that are negatively and totally correlated if they have a coefficient of -1 . In other words, as one variable increases the other variable decreases. A coefficient of zero means that there is no relationship

between variables, changes in one variable does not related to the change in the other variable.

3.6.4 Comparing groups

Independent samples *t*-test was used in the present study in order to reveal if there were significant differences between primary school teachers' knowledge and perception of dyslexia, with regard to taking or not taking a course about dyslexia, reading or not reading a book or an article about dyslexia and teaching or not teaching a student with dyslexia. There were two independent samples for each research question. For this reason, independent samples *t*- test was conducted. The following part of the chapter explains *t*- test.

t test is a parametric test that is used to compare the means of two samples. In other words, it is used to examine if the scores of two groups are different or not. Data are gathered from two samples and the means of the samples are measured. These actual means of the samples are compared. There are two different types of *t*-test which are independent *t*- test and dependent *t*- test. Independent *t*- test is used when data are collected from two different samples who are exposed to different experimental conditions. On the other hand, dependent *t*-test is used when the same participants were exposed to different experimental conditions (Field, 2009). In the present study independent *t*- test was used.

Before conducting a *t*-test, the assumptions of *t*-test are needed to be satisfied. The next part is about the assumptions of *t*- test.

3.6.4.1 Assumptions of *t*- test

The first step to conduct an independent *t*-test is to check up how the data is measured. The data should be measured at least at the interval level. Also the data gathered from different participants should be independent and should not be affected from other participants' responses.

The next step is to control the normality of the data. The data is expected to be distributed normally. However, if the sample size is large, nonnormality is not a problem as *t*-test robust against violating normality. The normality of the distribution can be tested with the kurtosis and skewness values. In a data with a normal distribution the kurtosis and skewness values are zero. If the value is further from zero this means that the data is not normally distributed. Positive values of skewness show aggregated scores on the left with a pointy and heavy tailed distribution. Negative values of skewness show aggregated scores on the right with a flat and light tailed distribution (Field, 2009).

Another step is to control the homogeneity of variance. Homogeneity of variance is controlled with Levene's test and the variances are needed to be the same throughout all the data. If the Levene's test value is lower than .05 ($p < .05$) this means that the variances are significantly different. If the score is higher than .05 ($p > .05$) this means that the variances are equal and the Levene's test is non-significant.

After all the assumptions are controlled *t*- test is conducted and the exact significance value of *t* is measured. If the *p* value is greater than .05 this means that there is no significance difference between the variables. If the *p* value is smaller than .05 this means there is a significance difference between the means of variables (Field, 2009).

3.6.4.2 Effect size

Another important point about *t*-test is calculating the effect size. Effect size is a value used to answer the question ‘how large is the difference’ Effect size represents score distances in units of variability and is symbolized with *d*. It has a value between 0 and 1. According to Cohen (1988) *d* = .2 represents a small sized effect, *d* = .5 medium sized effect, *d* = .8 large sized effect.

The analyses were carried out in four steps. In the first step exploratory factor analyses were carried out and the number of factors were determined. In the second step, according to teachers’ responses, factor based scores were created. In the third step factor based scores were used to carry out correlational analysis and in the last step group comparisons were carried out.

This chapter of the study includes detailed data about research design, sample, instrument, data collection and data analyses procedures. The following chapter includes results of the analyses.

CHAPTER 4

RESULTS

This chapter of the study is organized around the research questions and includes five parts. The first part shows the results of exploratory factor analysis with the factor based scores. Second part is about the reliability of the scale and includes the results of Cronbach's alfa test for all of the sub-scales which were formed based on the results of exploratory factor analysis. The third part shows the results of first main question and its sub-questions which are related to primary school teachers' knowledge of dyslexia and includes both descriptive and inferential statistics. The fourth part indicates the results of second main question and its sub-questions which are related to primary school teachers' perception of dyslexia and includes descriptive statistics and inferential statistics. The last part of this chapter shows the results for the third main question and its sub- questions which are related to primary school teachers' perception of dyslexic students' classroom behaviors and includes both descriptive and inferential statistics.

4.1 Exploratory factor analysis

The first step in conducting an exploratory factor analysis was to check whether the data was appropriate for factor analysis or not. KMO and Bartlett's tests were applied for this reason. KMO value of the present data was 0.71. KMO value was greater than 0.70 indicating that the data was good for factor analysis (Hutcheson & Sofroniou, 1999) and Bartlett's test was significant which meant that the data was appropriate to conduct factor analysis.

4.1.1 Factor extraction and rotation

Principal axis factor extraction technique was used in extraction and varimax rotation technique was used in rotation. In order to decide the number of the factors, eigenvalues and scree plot were investigated. Before rotation, there were 18 factors with an eigenvalue which were greater than 1. These factors explained 69.17% of total variance. Table A4 (Appendix B) displays eigenvalues and it also explains total variance.

The scree plot was also analyzed in order to determine how many factors to retain. The eigenvalue dramatically decreases between first and second factors. This sharp decrease continues until fifth factor and then it slows down. After the seventeenth factor the line started to level off. Therefore, seventeen factors retained for rotation. Figure 1 shows the scree plot of first principal factor analysis and Table A5 (Appendix C) shows rotated factor matrix.

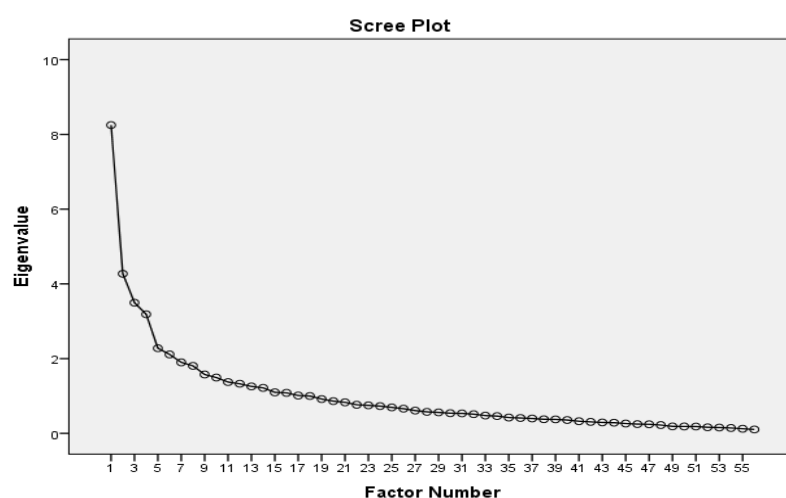


Figure 1. Scree plot of first P A F

According to Stevens (2002) regardless of the sample size, the factors are reliable on the condition that they include items with four or more loadings .60. Based on Stevens (2002), the present study included 3 factors which had items with factor loadings .60 and more. These pretended three factors included 29 items. When the items are examined it was seen that three of these 29 items, items 7, 10, and 41, were loaded under two different factors and two of them, items 25, 26 , were loaded negatively. That is why these five items were eliminated and the principal axis factoring was carried again with the items forming these three factors.

The second factor analysis had a better KMO value. The KMO value was 0.839 which indicated a great data for factor analysis according to Hutcheson and Sofroniou (1999). The Bartlett's Test was significant.

In the second principal axis factor analysis there were five factors with eigenvalues greater than 1 which was explaining 58.64 % of total variance. The scree plot was also examined and it was seen that after the fifth factor the line started to level off. For this reason, five factors were rotated. Figure 2 demonstrates the scree plot of second PAF and Table 6 shows rotated factor matrix.

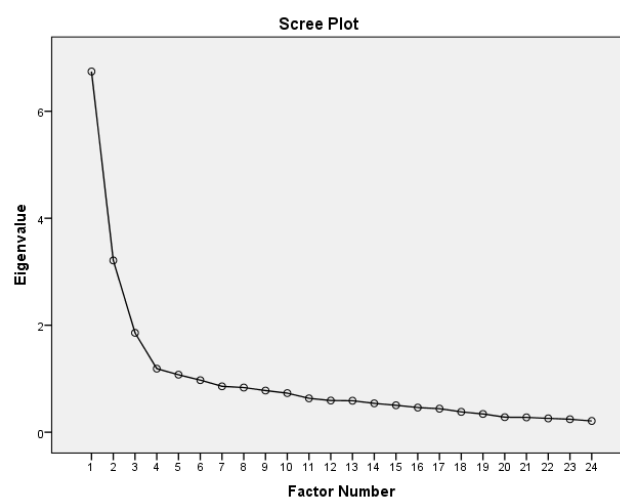


Figure 2. Scree plot of second P A F

Table 6. Rotated Factor Matrix of Second PAF

Item Number	Factor				
	1	2	3	4	5
q16	.725				
q8	.717				
q15	.689				
q11	.668				
q9	.650		.310		
q13	.618				.560
q18	.614				
q12	.461		.379		
q17	.447				
q3	.441		.401		
q28		.740			
q20		.675			
q19		.648			
q24		.641			
q27		.597			
q21		.578			
q4			.610		
q6	.385		.536		
q2	.337		.463		
q5	.408		.455		
q37				.682	
q36				.669	
q38				.601	
q14	.434		.324		.567

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

When Table 6 was examined it was seen that there were items which were loaded on different factors and loaded lower than .40 on any factors. These items were 4, 6, 2, 5, 14. These items were eliminated according to Pedhazur and Schmelkins (1991).

The third PAF analysis was conducted with the items only loaded on a specific factor and with loadings higher than .40. That's why the third PAF was conducted with 19 items. The KMO value was .820 indicating a great data for factor analysis according to Hutcheson and Sofroniou (1999) and the Bartlett's Test was significant.

In the third PAF, three factors were extracted with eigenvalues greater than 1 explaining 53.40% of total variance. In the scree plot the line starts to level off after the third factor. Therefore, three factors were rotated. Figure 3 displays the scree plot of third PAF and Table 7 shows the results of rotation.

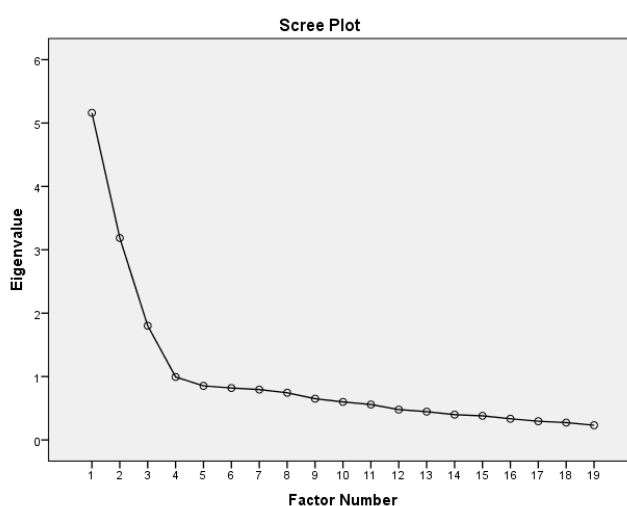


Figure 3. Scree plot of third P A F

Table 7. Rotated Factor Matrix of Third PAF

Item Number	Factor		
	1	2	3
q16	.743		
q15	.728		
q8	.708		
q9	.703		
q11	.698		
q13	.664		
q18	.652		
q12	.581		
q3	.566		
q17	.521		
q28		.733	
q20		.678	
q24		.657	
q19		.649	
q27		.580	
q21		.560	
q36			.691
q37			.667
q38			.592

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Based on the rotated factor matrix, three factors were important. In other words, PAF emphasized three factors ranging from three to ten variables with loadings minimum .521 and maximum .743. These results show reliable factor solutions according to Stevens (2002).

4.1.2 Factor naming

Factor one included the items 16,15,8,9,11,13,18,12,3 and 17. All of the ten items were constructed in order to measure the primary school teachers' knowledge of dyslexia. Therefore, the first factor was named as knowledge.

Factor two involved the items 28, 20, 24 ,19, 27, and 21. These 6 items were developed in order to assess primary teachers' perception of dyslexia. That's why the second factor was named as perception.

Factor three covered items 36, 37, 38. Initially items 36 and 37 were created in order to measure primary teachers' knowledge of dyslexia and later item 38 was created to measure primary school teachers' perception of dyslexia. After the factor analysis it was seen that these three items formed another third factor measuring a different area than knowledge and perception of dyslexia. When the items were examined, it was seen that all of these three items were focused on the classroom behaviors of dyslexic students so the third factor was named as classroom and the same analysis procedure was applied for the third factor with the same sub-questions.

4.1.3 Factor based scores

The outcomes of the exploratory factor analysis were used to constitute factor based scores. Factor based scores were calculated by adding the teachers' answers for every item on the factors. For example, for the knowledge factor a teachers' responses to the questions 16, 8, 15, 11, 9, 13, 18, 12, 17, 3 were added up. By this way every teacher had a total score for all the three factors and these scores were used to answer research questions. The minimum score was 10 and the maximum score was 50 for the knowledge factor. For the perception factor the minimum score was 6 and the

maximum score was 30 and for the last factor which was named as classroom the minimum score was 3 and the maximum score was 15. The distributions of the scores were shown on Table 8 for each factor.

Table 8. Descriptive Statistics of Factors

	Knowledge	Perception	Classroom
Mean	36.88	12.36	8.85
Median	37.00	12.00	9.00
Std. Deviation	7.78	5.35	3.19
Range	37.00	24.00	12.00
Minimum	13.00	6.00	3.00
Maximum	50.00	30.00	15.00
Skewness	-0.02	0.77	-0.02
Kurtosis	-0.41	0.14	-0.56

4.2 Reliability

The second part of this chapter includes results of Cronbach's alpha tests for each sub-scales. In order to examine the reliability of the scale Cronbach's alpha was calculated for each sub-scales and the results were shown in Table 9.

Table 9. Cronbach's Alpha Coefficients of Sub-scales

	Factor		
	Knowledge	Perception	Classroom
Cronbach's Alpha	.89	.81	.70

A reliable scale should have a Cronbach's alpha at least 0.70. Between the sub-scales classroom sub-scale had the lowest Cronbach's alpha coefficient with 0.70 which is also an acceptable value for a reliable scale. Perception sub-scale had 0.81 Cronbach's alpha coefficient which is a good value and knowledge sub-scale had 0.89 Cronbach's alpha coefficient which is a good value.

4.3 Primary school teachers' knowledge of dyslexia

This part of the study shows the results of the first main research question and its sub-questions which are related to primary school teachers' knowledge of dyslexia.

The first main research question examined primary school teachers' knowledge of dyslexia and was analyzed with the scores obtained from the knowledge factor. Descriptive statistics were used to depict the data. The mean score of the knowledge factor was 36.88 and the standard deviation was 7.48. The range was 37. The lowest score for the knowledge factor was 13 (n = 1) forming .5 percent of the sample. The highest score was 50 (n = 10) forming 5.00% of the sample. Higher scores on knowledge factor indicated better knowledge of dyslexia. The distribution of the data was displayed through a histogram and it was seen that the

data was distributed normally. Figure 4 shows the distribution histogram of teachers' knowledge of dyslexia.

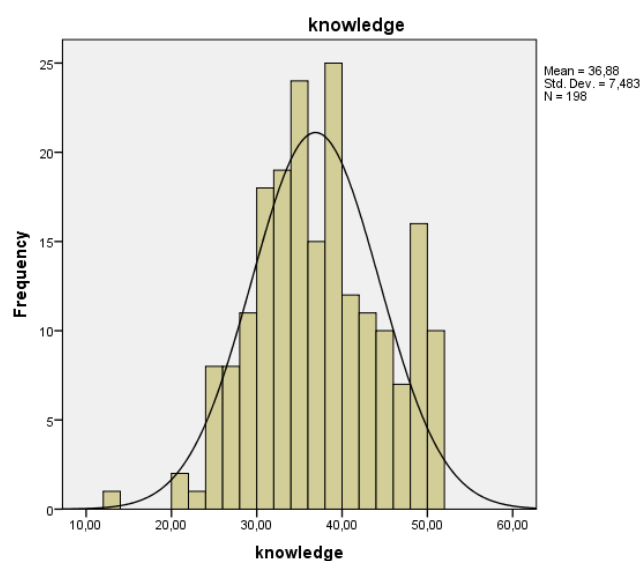


Figure 4. Distribution histogram of teachers' knowledge of dyslexia

4.3.1 The relation between teachers' knowledge of dyslexia and teaching experience

The first sub-research question was aimed to find out whether there is a significant relationship between primary school teachers' knowledge of dyslexia and their teaching experience. To examine primary school teachers' knowledge of dyslexia further, the first sub-research question investigated the relation between teachers' teaching experience and their knowledge with a Pearson Product Moment correlation analysis. Before conducting the analysis, a scatter plot was drawn. Figure 5 shows the scatter plot of knowledge and teaching experience.

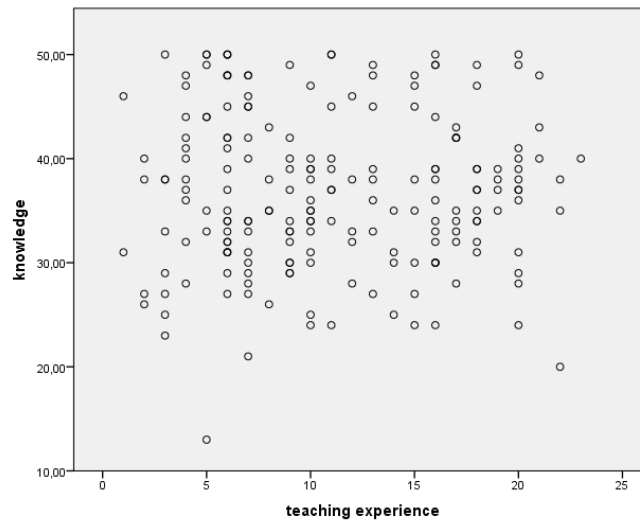


Figure 5. Scatter plot of teaching experience and knowledge

When the scatter plot was examined, it was seen that the curve was not linear so we could conduct correlational analysis (Field, 2009). The results indicated that there was no significant relationship between teachers' teaching experience and their knowledge of dyslexia; $r = .01$, $p > .05$. The results were shown in Table 10.

Table 10. Results of Correlational Analysis

	Teaching Experience	Knowledge	Perception	Classroom
Teaching Experience	1	.01	.20**	-.10
Knowledge		1	-.10	.21**
Perception			1	.11
Classroom				1

**. Correlation is significant at the 0.01 level.

4.3.2 The difference between teachers' knowledge of dyslexia with regard to taking a course

Besides teaching experience, taking a course about dyslexia during university education was also examined. Second sub- research question a) investigated whether there is a significant difference between teachers' knowledge of dyslexia with regard to taking a course about dyslexia during university education. In order to answer the research question Independent samples *t*- test was conducted.

Before the independent samples *t*- test was conducted, the assumptions of *t*- test were controlled. According to the assumptions the dependent variable should be measured on a continuous scale. This assumption is indemnified by factor based scores. The second assumption requires two independent groups for the independent variables and this assumption was satisfied with two different independent variables such as teachers who took a course about dyslexia and who did not. The third assumption depends on the independent observations of each sample. This assumption was satisfied in data gathering step. The communication between teachers were not allowed while they were answering the scale. In other words, every teacher answered the scale according to their own ideas and under the standard conditions. The data should be distributed normally for the fourth assumption of independent samples *t*- test. This assumption was controlled based on kurtosis and skewness values. The kurtosis value for the teachers who took a course about dyslexia during their university education was .66 and for the teachers who did not take a course about dyslexia was -.71. The skewness value was -.55 for the teachers who took a course and .11 for the teachers who did not take a course. These values are acceptable for normality. Histograms were also drawn to control the distribution of the data. Figure 6 represents the histogram of the teachers who took a course about

dyslexia and figure 7 represents the histogram of the teachers who did not take a course about dyslexia.

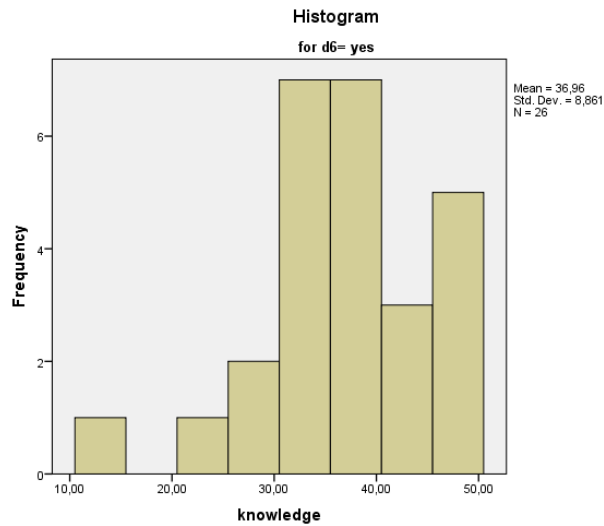


Figure 6. Histogram of knowledge of teachers who took a course

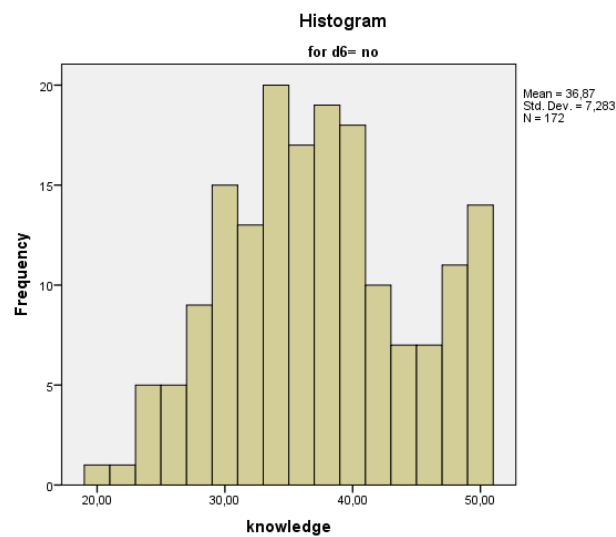


Figure 7. Histogram of knowledge of teachers who did not take a course

The homogeneity of the variance was controlled with Levene's test and it was seen that the knowledge variances of teachers who took a course about dyslexia and who did not take it were equal $F(1,196) = .86, p > .05$.

After testing all the assumptions independent samples *t*- test was conducted and primary school teachers' knowledge of dyslexia were examined in terms of taking a course about dyslexia during university education. The teachers who took a course about dyslexia during their university education had higher mean scores ($M = 36.96$, $SE = 1.74$) than the teachers who did not take a course about dyslexia during university education ($M = 36.87$, $SE = .56$). However, this difference was not significant; $t(196) = -.06$, $p > .05$; it represented small effect size, $d = -.01$. Table 11 displays the results of independent samples *t*- test.

Table 11. Independent Samples Test of Teachers' Knowledge with Regard to Taking a Course

	Teachers who took a			Teachers who did not take			<i>t</i>	Effect
	course			course				
	M	SD	Std. Error	M	SD	Std. Error		
Knowledge	36.96	8.86	1.74	36.87	7.28	0.56	-.06	-.01

4.3.3 The difference between teachers' knowledge of dyslexia with regard to taking an in-service seminar

Sub-research question 2 b) examined whether is there a significant difference between teachers' knowledge of dyslexia with regard to taking an in-service seminar about dyslexia. In order to answer the question independent samples *t*- test was conducted.

Before the test was conducted all the five assumptions of the *t*-test were controlled. According to the assumptions, the dependent variable should be measured on a continuous scale. This assumption was indemnified by factor based scores. The second assumption requires two independent groups for the independent variables and this assumption was satisfied with two different independent variables such as teachers who took an in-service seminar about dyslexia and who did not. The third assumption depends on the independent observations of each sample. This assumption was satisfied in data gathering step. As the fourth assumption, the normality of the data was controlled based on kurtosis and skewness values. The kurtosis value for the teachers who took an in-service seminar about dyslexia during their university education was .21 and for the teachers who did not take an in-service seminar about dyslexia was -.70. The skewness value was -.58 for the teachers who took an in-service seminar and .11 for the teachers who did not take an in-service seminar. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 8 represents the histogram of the teachers who took a course about dyslexia and figure 9 represents the histogram of the teachers who did not take a course about dyslexia.

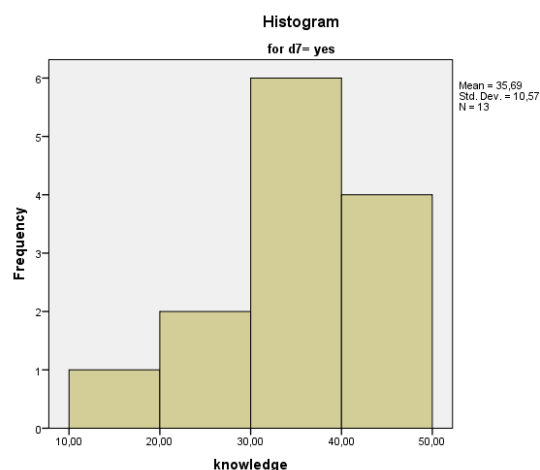


Figure 8. Histogram of knowledge of the teachers who took an in-service seminar

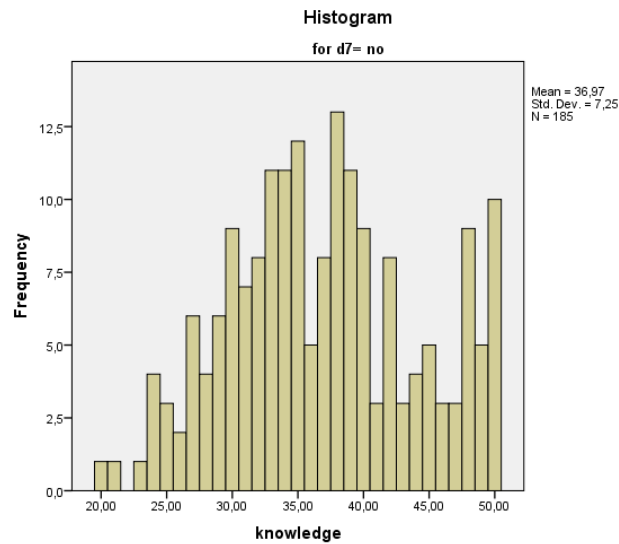


Figure 9. Histogram of knowledge of the teachers who did not take an in-service seminar

The homogeneity of the variance was controlled with Levene's test.

According to the results of the test, it was seen that the knowledge variances of teachers who took an in-service seminar about dyslexia and who did not take an in-service seminar were equal; $F(1,196) = 3.30, p > .05$.

After all the assumptions were controlled independent t – test was conducted for teachers' knowledge with regard to taking an in service seminar about dyslexia. The test results represented that there was no significant difference between knowledge of the teachers who took an in-service seminar about dyslexia ($M = 35.69, SE = 2.93$) and knowledge of the teachers who did not take an in-service seminar about dyslexia ($M = 36.97, SE = .53$); $t(196) = .59, p > .05$; it represented small effect size, $d = .14$. The results of t - test are presented in the Table 12.

Table 12. Independent Samples Test of Teachers' Knowledge with Regard to Taking an In-service Seminar

	Teachers who took in-			Teachers who did not take			<i>t</i> -value	Effect
	service seminar			in-service seminar				
	M	SD	Std. Error	M	SD	Std. Error		
Knowledge	35.69	10.57	2.93	36.97	7.25	0.53	.59	.14

4.3.4 The difference between teachers' knowledge of dyslexia with regard to reading a book or an article about dyslexia

Sub-research question 2 c) examined primary school teachers' knowledge of dyslexia with regard to reading a book or an article about dyslexia. This sub-research question states whether there is a significant difference between primary school teachers' knowledge of dyslexia with regard to reading a book or an article about dyslexia. In order to answer the question independent samples *t*-test was conducted after all of the five assumptions of the test was controlled. The normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who read a book or an article about dyslexia was -.72 and for the teachers who did not read a book or an article about dyslexia was -.38. The skewness value was .10 for the teachers who read a book or an article about dyslexia and -.02 for the teachers who did not read a book or an article about dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 10 represents the histogram of the teachers who read a book or an article about

dyslexia and figure 11 represents the histogram of the teachers who did not read a book or an article about dyslexia.

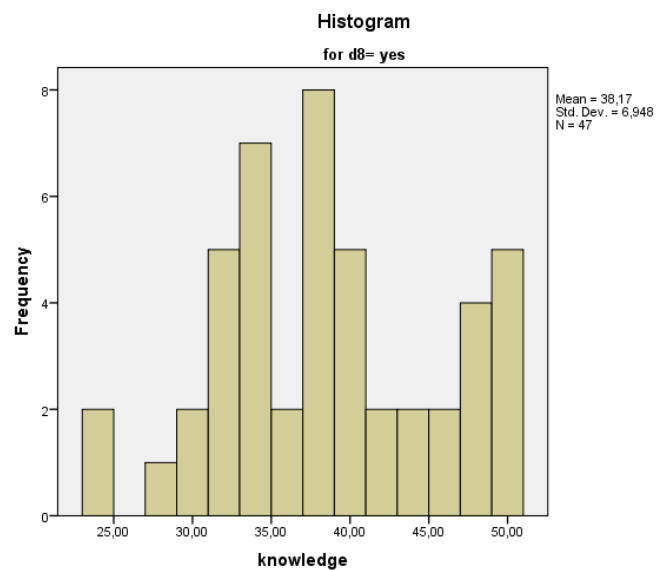


Figure 10. Histogram of knowledge of the teachers who read a book or an article

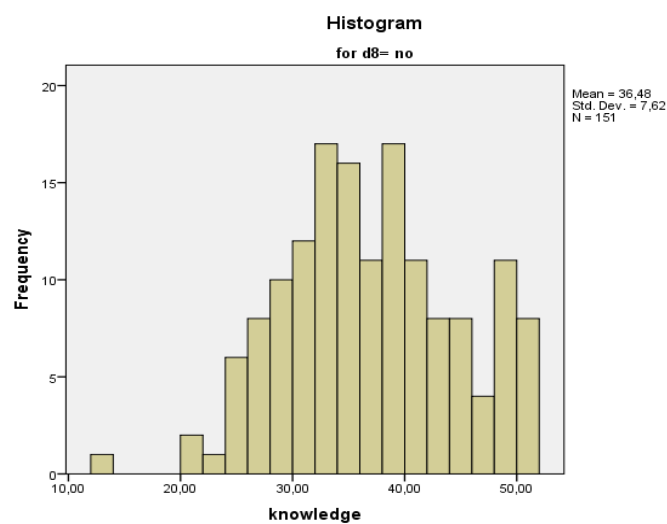


Figure 11. Histogram of knowledge of the teachers who did not read a book or an article

The homogeneity of the variance was controlled with Levene's test.

According to the results of the test it was seen that the knowledge variances of

teachers who read a book or an article about dyslexia and who did not read were equal; $F(1, 196) = .71, p > .05$.

After all the assumptions were satisfied, independent *t*-test was conducted. The results revealed that the teachers who read a book or an article about dyslexia had higher mean scores ($M = 38.17, SE = 1.01$) than the teachers who did not read a book or an article about dyslexia ($M = 36.48, SE = .62$). However, this difference was not significant. There was no significant difference between teachers' knowledge of dyslexia in terms of reading a book or an article about dyslexia; $t(196) = -1.35, p > .05$; it represented small effect size $d = -.23$. The results of *t*-test were shown in Table 13.

Table 13. Independent Samples Test of Teachers' Knowledge with Regard to Reading a Book or an Article about Dyslexia

	Teachers who read a book or an article			Teachers who did not read a book or an article			<i>t</i> -value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Knowledge	38.17	6.95	1.01	36.48	7.62	0.62	-1.35	-.23

4.3.5 The difference between teachers' knowledge of dyslexia with regard to teaching a student with dyslexia

Sub-research question 2 d) examines whether there is a significant difference between primary school teachers' knowledge of dyslexia with regard to teaching a

student with dyslexia. Primary school teachers' knowledge of dyslexia was examined with regard to teaching a student with dyslexia by conducting an independent samples *t*- test. Before the *t*- test was conducted, the assumptions of the test were controlled.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who taught a student with dyslexia was -.71 and for the teachers who did not teach a student with dyslexia was -.36. The skewness value was .07 for the teachers who taught a student with dyslexia and -.02 for the teachers who did not teach a student with dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 12 represents the histogram of the teachers who taught a student with dyslexia and figure 13 represents the histogram of the teachers who did not teach a student with dyslexia.

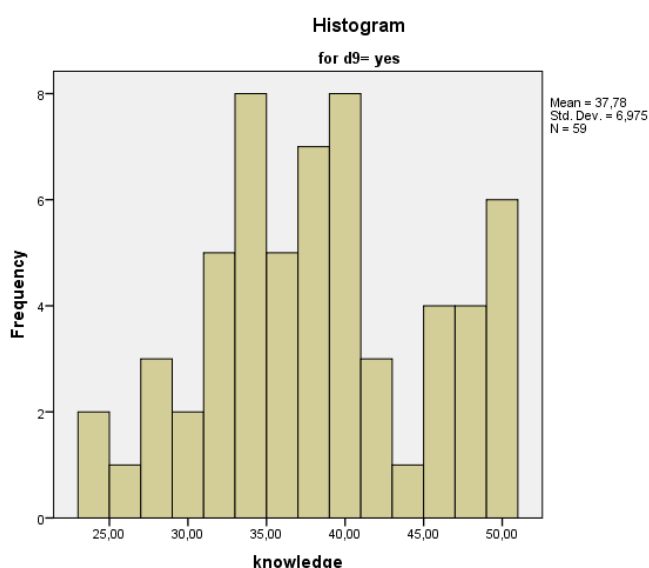


Figure 12. Histogram of knowledge of the teachers who taught a student with dyslexia

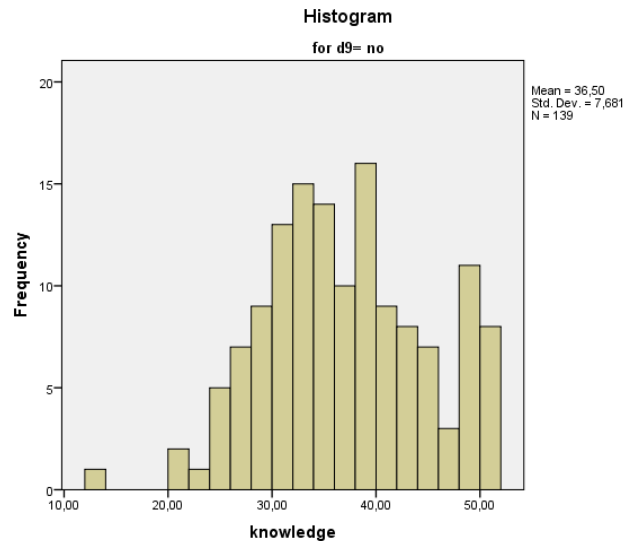


Figure 13. Histogram of knowledge of the teachers who did not teach a student with dyslexia

The homogeneity of the variance was controlled with Levene's test.

According to the results of the test it was seen that the knowledge variances of teachers who taught a student with dyslexia and who did not teach a student with dyslexia were equal; $F(1, 196) = 84, p > .05$.

After all the assumptions were satisfied independent samples *t*- test was conducted. The results marked that the teachers who taught a student with dyslexia had higher mean scores ($M = 37.78, SE = .90$) than the teachers who did not teach a student with dyslexia ($M = 36.50, SE = .65$). However, this difference was not significant. There was no significant difference between knowledge of the teachers who taught a student with dyslexia and knowledge of the teachers who did not teach a student with dyslexia; $t(196) = -1.10, p > .05$; it represented small effect size $d = -.17$. Table 14 illustrates the results.

Table 14. Independent Samples Test of Teachers' Knowledge with Regard to Teaching a Student with Dyslexia

	Teachers who read taught a			Teachers who did not teach			<i>t</i> -value	Effect
	student with dyslexia			a student with dyslexia				
	M	SD	Std. Error	M	SD	Std. Error		
Knowledge	37.78	6.98	0.91	36.50	7.68	0.65	-1.10	.17

4.4 Primary school teachers' perception of dyslexia

This part of the study includes the results of second main research question and its sub- questions which are related to primary school teachers' perception of dyslexia.

Second main research question examines what primary school teachers' perception of dyslexia are. Scores obtained from perception factor and descriptive statistics were used to analyze the data. The mean score for perception factor was 12.35 and the standard deviation was 5.34. The range was 12. The lowest score for perception factor was 6 forming 15.4 percent of the sample ($n = 31$). The highest score was 30 forming .5 percent of the sample ($n = 1$). High scores on this factor indicated better perception of dyslexia. The distribution of the data was represented through a histogram and when the histogram was analyzed it was seen that the data was not distributed normally. Figure 14 represents the distribution histogram of teachers' perception of dyslexia.

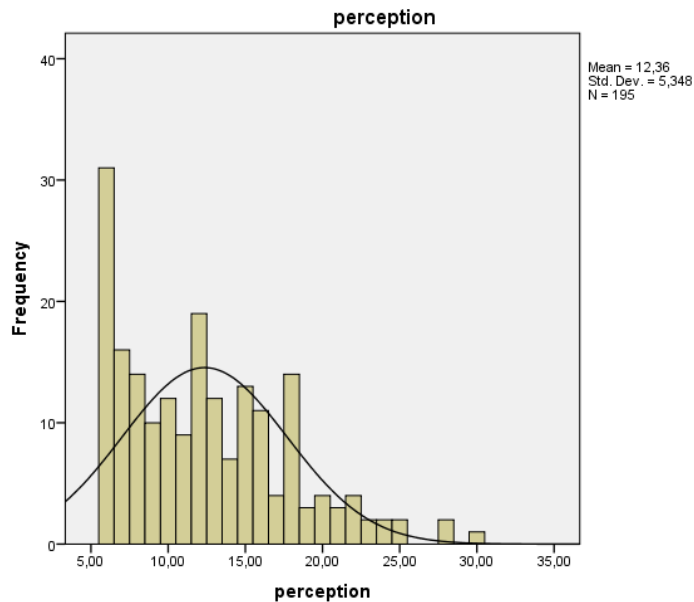


Figure 14. Histogram of teachers' perception

4.4.1 The relation between teachers' perception of dyslexia and teaching experience

To examine primary teachers' perception of dyslexia in details, the sub-research question 3 investigated the relation between teachers' perception of dyslexia and their teaching experience. This sub-research question states whether there is a significant relation between primary school teachers' perception of dyslexia and their teaching experience. In order to answer the question a Pearson Product Moment correlation analysis was conducted. Before conducting the analysis, a scatter plot was drawn. Figure 15 shows the scatter plot of perception and teaching experience.

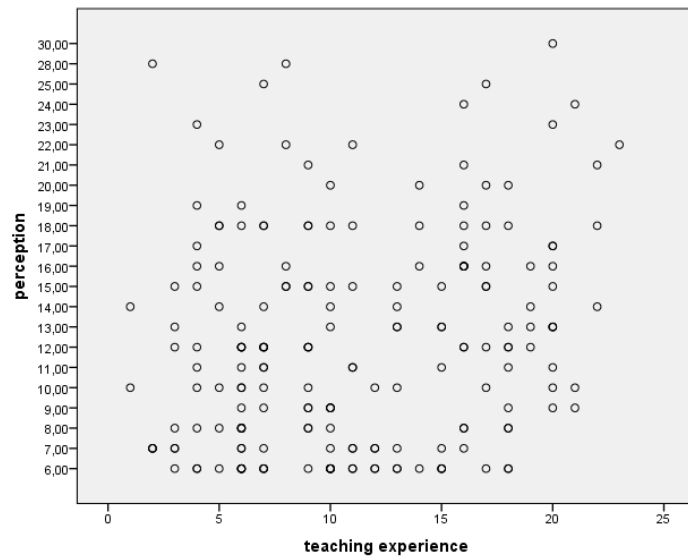


Figure 15. Scatter plot of teaching experience and perception

When the scatter plot was examined, it was seen that the curve was not linear so it was possible to conduct correlational analysis. Pearson Product Moment correlation analysis was conducted in order to examine the relationship between primary school teachers' experience and their perception of dyslexia. As shown in the table 10, the results indicated that there was a significant relationship between primary teachers' experience and their perception of dyslexia. However, the correlation coefficient was low. In other words, there was a weak positive relationship between primary school teachers' experience and their perception of dyslexia, $r = .20$ $p < .01$.

4.4.2 The difference between teachers' perception of dyslexia with regard to taking a course about dyslexia

Sub-research question 4 a) examines whether there is a significant difference between primary school teachers' perception of dyslexia with regard to taking a course about dyslexia during university education. Primary school teachers'

perception of dyslexia with regard to taking a course during university education was examined by conducting independent samples *t*- test. Before conducting the test all assumptions of *t*- test were checked.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who took a course about dyslexia during university education was -.71 and for the teachers who did not take a course about dyslexia during university education was -.36. The skewness value was .07 for the teachers who took a course about dyslexia and -.02 for the teachers who did not take a course about dyslexia. These values are acceptable Histograms were also drawn to control the distribution of the data. Figure 16 represents the histogram of the teachers who took a course about dyslexia during university education and figure 17 represents the histogram of the teachers who did not take a course about dyslexia.

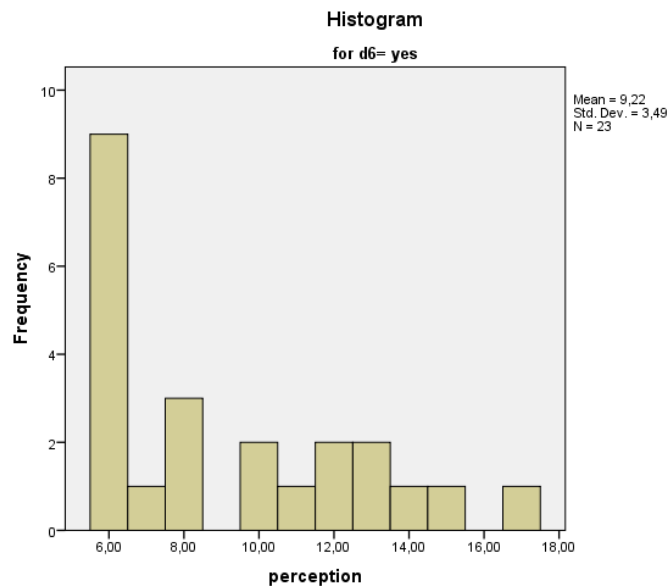


Figure 16. Histogram of perception of the teachers who took a course about dyslexia

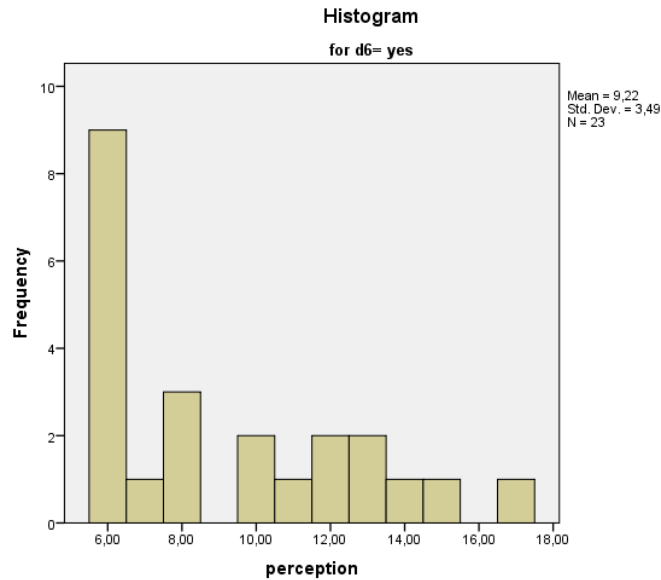


Figure 17. Histogram of perception of the teachers who did not take a course about dyslexia

The homogeneity of the variance was controlled with Levene's test.

According to the results of the test it was seen that the perception variances of teachers who took a course about dyslexia and who did not take a course about dyslexia were equal ; $F(1, 193) = .84, p > .05$.

After all the assumptions were controlled, independent samples *t*- test was conducted. The results of independent *t*- test revealed that there was a significant difference between perception of primary school teachers who took a course about dyslexia during university education ($M = 9.22, SE = .73$) and perception of primary school teachers who did not take a course about dyslexia during university education ($M = 12.78, SE = .41$); $t(193) = 3.06, p < .05$; and the difference is large; $d = -.82$. Table 15 demonstrates the result of *t*- test.

Table 15. Independent Samples Test of Teachers' Perception with Regard to Taking a Course

	Teachers who took a course			Teachers who did not take course			<i>t</i> -value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Perception	9.22	3.49	0.73	12.78	5.42	0.41	3.06	-.82

4.4.3 The difference between teachers' perception of dyslexia with regard to taking an in-service seminar about dyslexia

Sub-research question 4 b) states whether there is a significant difference between primary school teachers' perception of dyslexia with regard to taking an in-service seminar about dyslexia. Primary school teachers' perception of dyslexia with regard to taking an in-service seminar about dyslexia were examined by conducting independent samples *t*-test. Before conducting the test all assumptions of *t*-test were checked.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who took an in-service seminar about dyslexia was .08 and for the teachers who did not take an in-service seminar about dyslexia was -.14. The skewness value was .98 for the teachers who took an in-service seminar about dyslexia and -.67 for the teachers who did not take an in-service seminar about dyslexia. These values are acceptable. Histograms were also drawn to control the

distribution of the data. Figure 18 represents the histogram of the teachers who took an in-service seminar about dyslexia and figure 19 represents the histogram of the teachers who did not take an- in-service seminar about dyslexia.

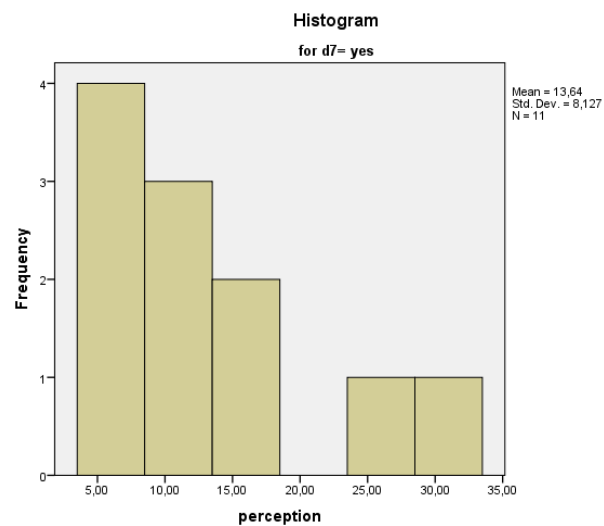


Figure 18. Histogram of perception of the teachers who took an in-service seminar

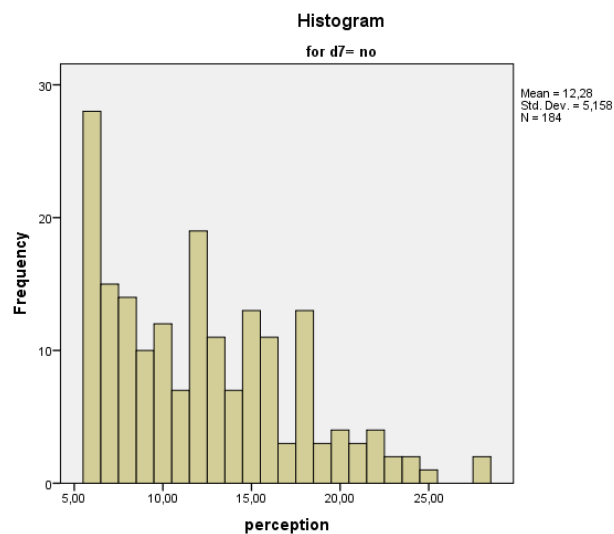


Figure 19. Histogram of perception of the teachers who did not take an in-service seminar

The homogeneity of the data was controlled with The Levene's test. The results showed that the variances of the teachers who took an in-service seminar about dyslexia and who did not take an in-service seminar were equal; $F(1,193) = 5.53, p > .05$.

After all the assumptions were satisfied independent samples *t*- test was conducted. The results (Table 16) showed that the teachers who took an in-service seminar about dyslexia had higher mean scores ($M = 13.63, SE = 2.45$) than the teachers who did not ($M = 12.28, SE = .38$). However, this difference was not significant. There was no significant difference between primary school teachers' perception of dyslexia with regard to taking an in-service seminar about dyslexia; $t(193) = -.81, p > .05$; it represented small effect size $d = -.19$.

Table 16. Independent Samples Test of Teachers' Perception with Regard to Taking an in-service Seminar

	Teachers who took in-			Teachers who did not take			<i>t</i> -value	Effect
	service seminar			in-service seminar				
	M	SD	Std. Error	M	SD	Std. Error		
Perception	13.64	8.13	2.45	12.28	.38	0.53	-.81	.19

4.4.4 The difference between teachers' perception of dyslexia with regard to reading a book or an article about dyslexia

Sub-research question 4 c) states whether there is a significant difference between primary school teachers' perception of dyslexia with regard to reading a book or an article about dyslexia. Primary school teachers' perception of dyslexia with regard to reading a book or an article about dyslexia were examined by conducting independent samples *t*-test. Before conducting the test all assumptions of *t*-test were checked.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who read a book or an article about dyslexia was 1.71 and for the teachers who did not read a book or an article about dyslexia was -.20. The skewness value was 1.24 for the teachers who read a book or an article about dyslexia and .64 for the teachers who did not read a book or an article about dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 20 represents the histogram of the teachers who read a book or an article about dyslexia and figure 21 represents the histogram of the teachers who did not read a book or an article about dyslexia.

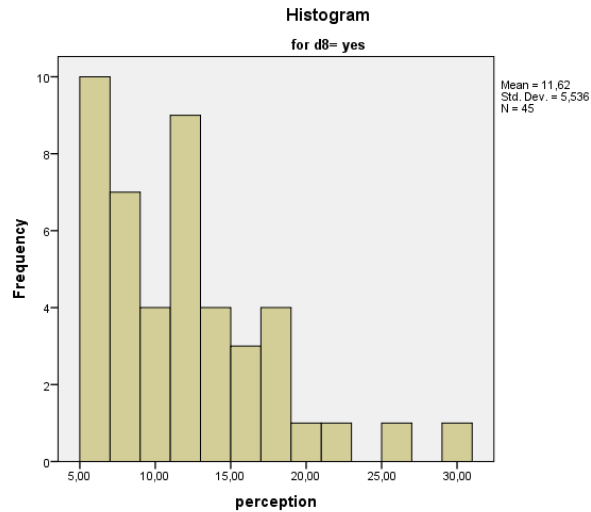


Figure 20. Histogram of perception of the teachers who read a book or an article

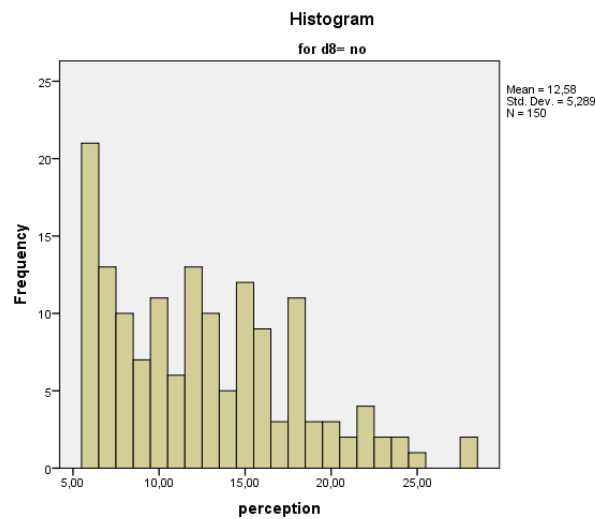


Figure 21. Histogram of perception of the teachers who did not read a book or an article

The homogeneity of the data was controlled with Levene's test. The results indicated that the variances of the teachers who read a book or an article about dyslexia and who did not read a book or an article about dyslexia were equal; $F(1,193) = .33, p > .05$.

After all the assumptions were satisfied independent samples *t*- test was conducted. The results indicated that there was no significant difference between perception of the teachers who read a book or an article about dyslexia ($M = 11.62$, $SE = .8$) and perception of the teachers who did not read a book or an article about dyslexia ($M = 12.58$, $SE = .43$); $t (193) = 1.05$, $p > .05$.; it represented small effect size $d = .17$. Table 17 shows the results.

Table 17. Independent Samples Test of Teachers' Perception with Regard to Reading a Book or an Article

	Teachers who read a book or an article			Teachers who did not read a book or an article			<i>t</i> -value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Perception	11.62	5.54	0.83	12.58	5.29	0.43	1.05	.17

4.4.5 The difference between teachers' perception of dyslexia with regard to teaching a student with dyslexia

Sub-research question 4 d) states whether there is a significant difference between primary school teachers' perception of dyslexia with regard to teaching a student with dyslexia. Primary school teachers' perception of dyslexia were examined with regard to teaching a student with dyslexia by conducting an independent samples *t*- test. Before the *t*- test was conducted, the assumptions of the test were controlled.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who taught a student with dyslexia was .71 and for the teachers who did not teach a student with dyslexia was -.10. The skewness value was 1.05 for the teachers who taught a student with dyslexia and .64 for the teachers who did not teach a student with dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 22 represents the histogram of the teachers who taught a student with dyslexia and figure 23 represents the histogram of the teachers who did not teach a student with dyslexia.

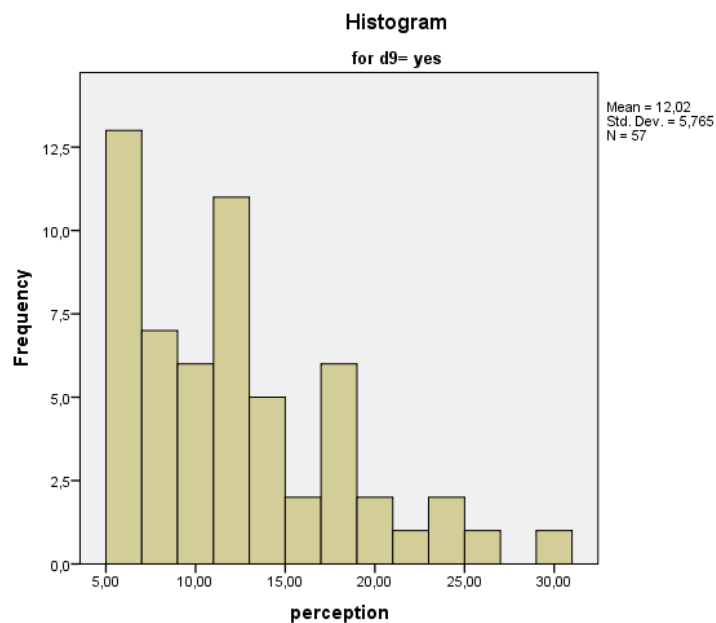


Figure 22. Histogram of perception of the teachers who taught a student with dyslexia

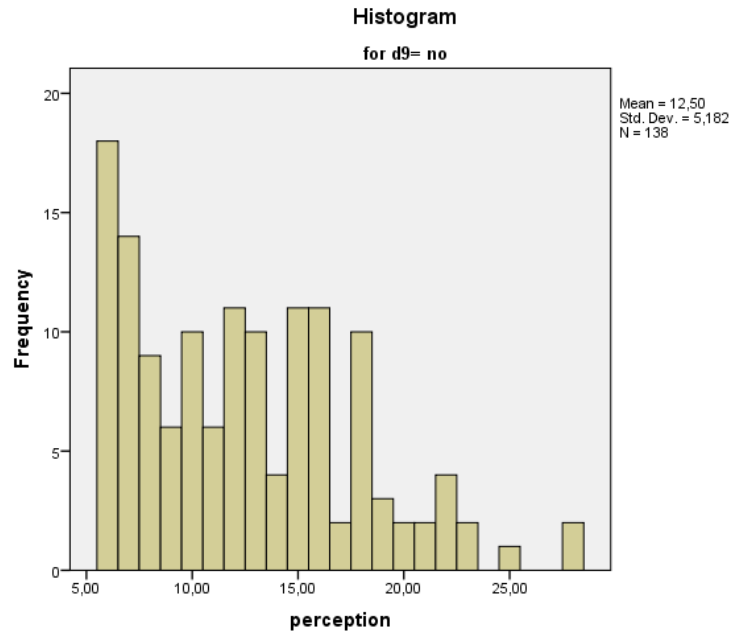


Figure 23. Histogram of perception of the teachers who did not teach a student with dyslexia

The homogeneity of the data was checked with the Levene's test. The results showed that the homogeneity of the variances were equal; $F(1,193) = .17, p > .05$.

Subsequent to satisfying the assumptions, independent samples *t*-test was conducted. The results indicated that there was no significant difference between perception of the teachers who taught a student with dyslexia ($M = 12.01, SE = .76$) and perception of the teachers who did not teach a student with dyslexia ($M = 12.50, SE = .44$); $t(193) = .57, p > .05$; it represented small effect size $d = .08$. Table 18 indicates the results of independent samples *t*-test.

Table 18. Independent Samples Test of Teachers' Perception with Regard to Teaching a Student with Dyslexia

	Teachers who taught a student with dyslexia			Teachers who did not teach a student with dyslexia			<i>t</i> -value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Perception	12.02	5.76	0.76	15.50	5.18	0.44	.57	.08

4.5. Primary school teachers' perception of dyslexic students' classroom behaviors

This part of the study includes the results of third main research question and its sub-questions which are related to primary school teachers' perception of dyslexic students' classroom behaviors.

Third main-research question examined what primary school teachers' perception of dyslexic students' classroom behaviors are. This question was answered with the scores obtained from classroom factor. The mean scores for primary school teachers' perception of dyslexic students' classroom behaviors was 8.84 and the standard deviation was 3.18. The range was 12. The lowest score for classroom factor was 3 forming 8 percent of the sample ($n = 16$) and the highest score was 15 forming 5 percent of the sample ($n = 10$). The distribution of the classroom scores were represented with a distribution histogram. Figure 24 represents the distribution histogram of teachers' classroom scores.

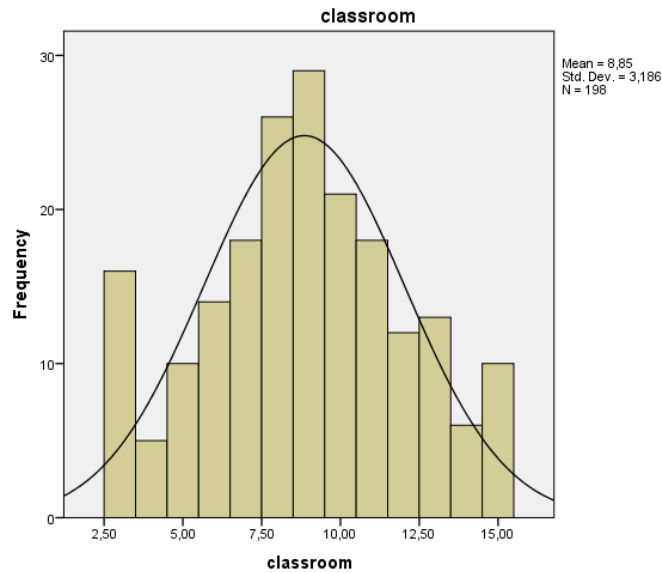


Figure 24. Histogram of teachers' classroom scores

4.5.1 The relation between teachers' perception of dyslexic students' classroom behaviors and teaching experience

Sub-research question 5 states whether there is a significant relation between primary school teachers' perception of dyslexic students' classroom behaviors and their teaching experience. In order to answer the question a Pearson Product Moment correlation analysis was conducted. Before conducting the analysis, a scatter plot was drawn. Figure 25 shows the scatter plot of teachers' perception of dyslexic students' classroom behaviors and teaching experience.

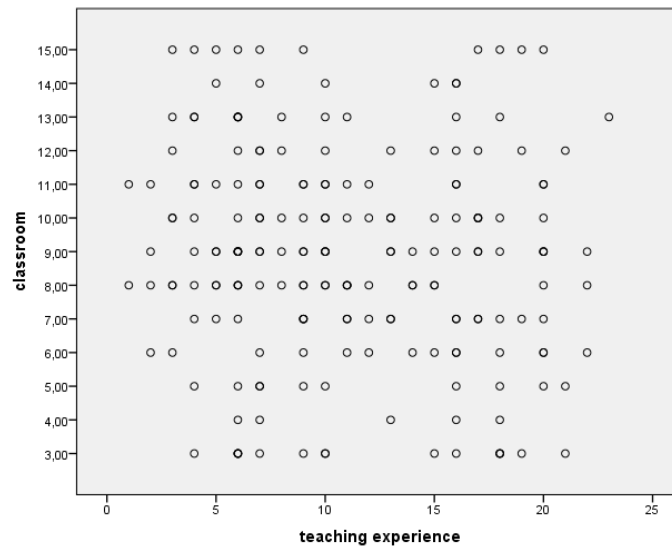


Figure 25. Scatter plot of teaching experience and perception of classroom behaviors

When the scatter plot was examined, it was seen that the curve was not linear so it was possible to conduct correlational analysis. The results indicated that there was no significant relationship between primary school teachers' teaching experience and their perception of dyslexic students' classroom behaviors, $r = -.09$, $p > .05$. The results were shown in Table 10.

4.5.2 The difference between teachers' perception of dyslexic students' classroom behaviors with regard to taking a course about dyslexia

Sub-research question 6 a) states whether there is a significant difference between primary school teachers' perception of dyslexic students' classroom behaviors with regard to taking a course about dyslexia during university education. Primary school teachers' perception of dyslexic students' classroom behaviors with regard to taking a course during university education were examined by conducting independent samples *t*-test. Before conducting the test all assumptions of *t*-test were checked.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who took a course about dyslexia during university education was $-.45$ and for the teachers who did not take a course about dyslexia during university education was $-.56$. The skewness value was $-.01$ for the teachers who took a course about dyslexia and $-.02$ for the teachers who did not take a course about dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 26 represents the histogram of the teachers who took a course about dyslexia during university education and figure 27 represents the histogram of the teachers who did not take a course about dyslexia.

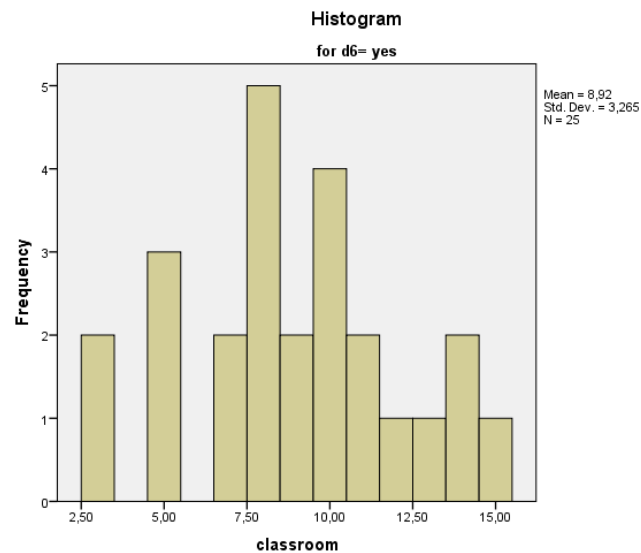


Figure 26. Histogram of classroom scores of teachers who took a course about dyslexia

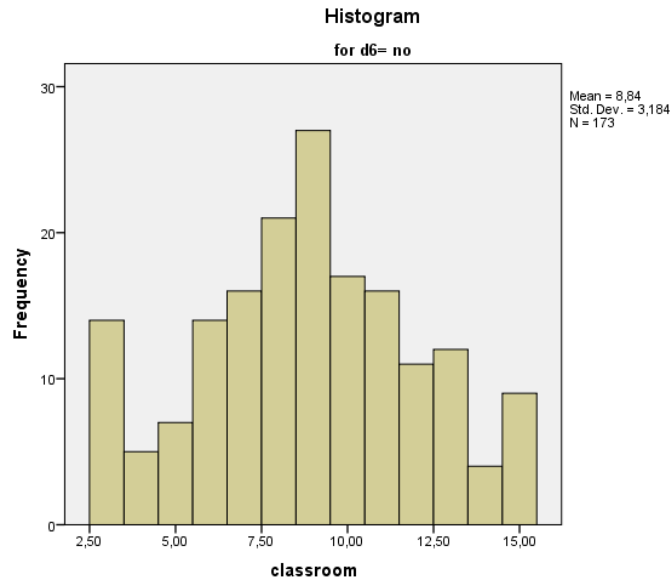


Figure 27. Histogram of classroom scores of teachers who did not take a course about dyslexia

The homogeneity of the variance was controlled with Levene's test.

According to the results of the test it was seen that the classroom variances of teachers who took a course about dyslexia and who did not take a course about dyslexia was not equal ; $F(2, 30.97) = .00, p < .05$.

After all the assumptions were satisfied, independent samples *t*- test was conducted. The results showed that teachers who took a course about dyslexia had higher mean scores ($M = 8.92, SE = .65$) than the teachers who did not take a course about dyslexia during their university education ($M = 8.84, SE = .24$). However, this difference was not significant. There was no significant difference between teachers' perception of dyslexic students' classroom behaviors in terms of taking a course about dyslexia during their university education; $t(196) = -.12, p > .05$; it represented small effect size, $d = -.02$. Table 19 shows the results.

Table 19. Independent Samples Test of Teachers' Classroom Scores with Regard to Taking a Course

	Teachers who took a course			Teachers who did not take course			<i>t</i> - value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Classroom	8.92	3.26	0.65	8.84	3.18	0.24	-.12	-.02

4.5.3 The difference between teachers' perception of dyslexic students' classroom behaviors with regard to taking an in-service seminar about dyslexia

Sub-research question 6 b) states whether there is a significant difference between primary school teachers' perception of dyslexic students' classroom behaviors with regard to taking an in-service seminar about dyslexia. In order to answer the research question independent samples *t*- test was conducted. Before conducting the test all assumptions of *t*- test were checked.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who took an in-service seminar about dyslexia was -1.18 and for the teachers who did not take an in-service seminar about dyslexia was -.51. The skewness value was .11 for the teachers who took an in-service seminar about dyslexia and -.04 for the teachers who did not take an in-service seminar about dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 28 represents the histogram of

the teachers who took an in-service seminar about dyslexia and figure 29 represents the histogram of the teachers who did not take an- in-service seminar about dyslexia.

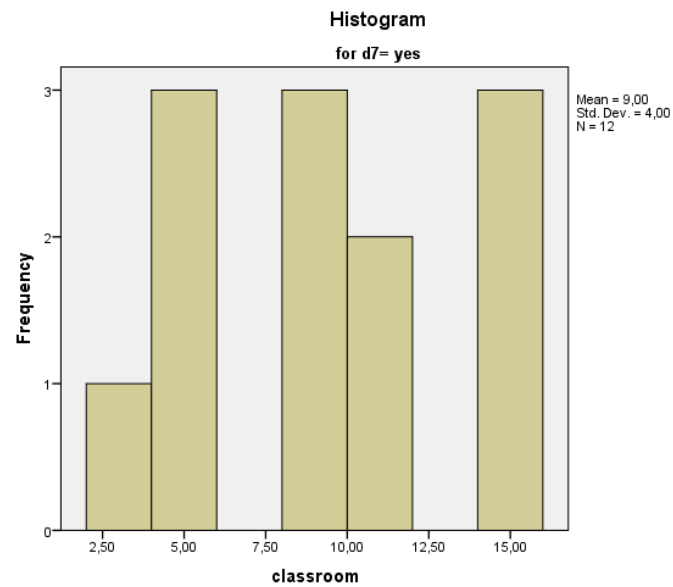


Figure 28. Histogram of classroom scores of the teachers who took an in-service seminar

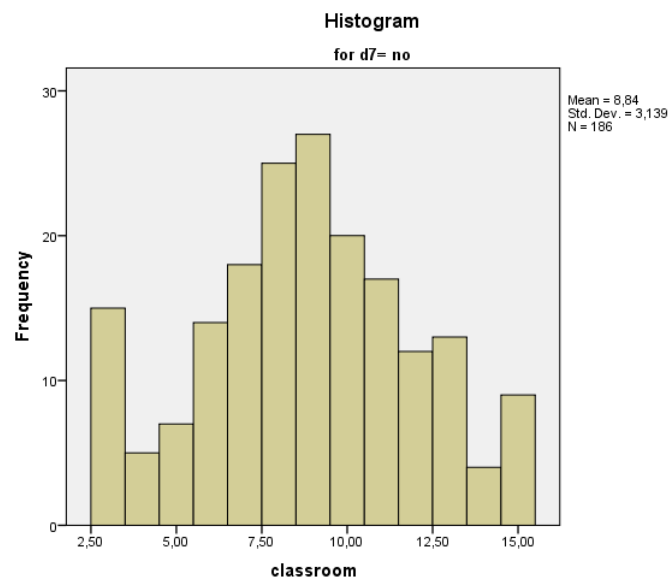


Figure 29. Histogram of classroom scores of the teachers who did not take an in-service seminar

The homogeneity of the data was controlled with The Levene's test. The results showed that the variances of the teachers who took an in-service seminar about dyslexia and who did not take an in-service seminar were equal; $F(1,196) = 1.37, p > .05$.

After controlling the assumptions, independent samples *t*-test was conducted. The results showed that the teachers who took an in-service seminar about dyslexia had higher mean scores ($M = 9.00, SE = 1.15$) than the teachers who did not take an in-service seminar about dyslexia ($M = 8.84, SE = .23$). However, this difference was not significant. In other words, there was no significant difference between teachers' perception of dyslexic students' classroom behaviors in terms of taking an in-service seminar about dyslexia; $t(196) = -.17, p > .05$; it represented small effect size, $d = -.04$. Table 20 shows the results.

Table 20. Independent Samples Test of Teachers' Classroom Scores with Regard to Taking an In-service Seminar

	Teachers who took in-service seminar			Teachers who did not take in-service seminar			<i>t</i> -value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Classroom	9.00	4.00	1.15	8.84	3.14	0.23	-.17	-.04

4.5.4 The difference between teachers' perception of dyslexic students' classroom behaviors with regard to reading a book or an article about dyslexia

Sub-research question 6 c) states whether there is a significant difference between primary school teachers' perception of dyslexic students' classroom behaviors with regard to reading a book or an article about dyslexia. In order to answer the research question independent samples *t*- test was conducted. Before conducting the test all assumptions of *t*- test were checked.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who read a book or an article about dyslexia was -.97 and for the teachers who did not read a book or an article about dyslexia was -.41. The skewness value was .00 for the teachers who read a book or an article about dyslexia and .02 for the teachers who did not read a book or an article about dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 30 represents the histogram of the teachers who read a book or an article about dyslexia and figure 31 represents the histogram of the teachers who did not read a book or an article about dyslexia.

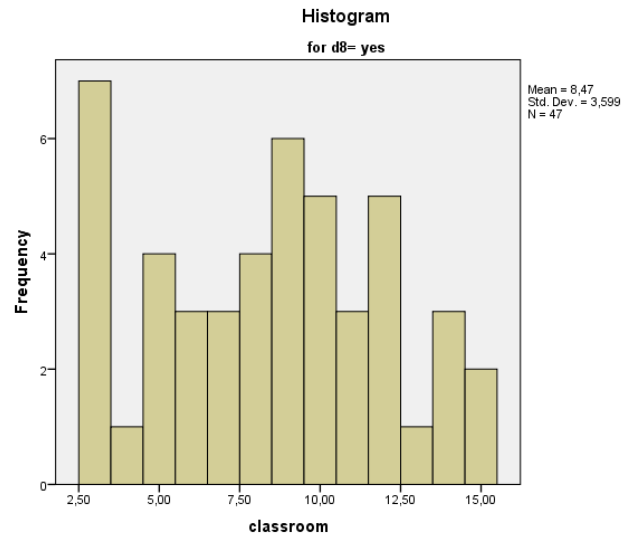


Figure 30. Histogram of classroom scores of the teachers who read a book or an article

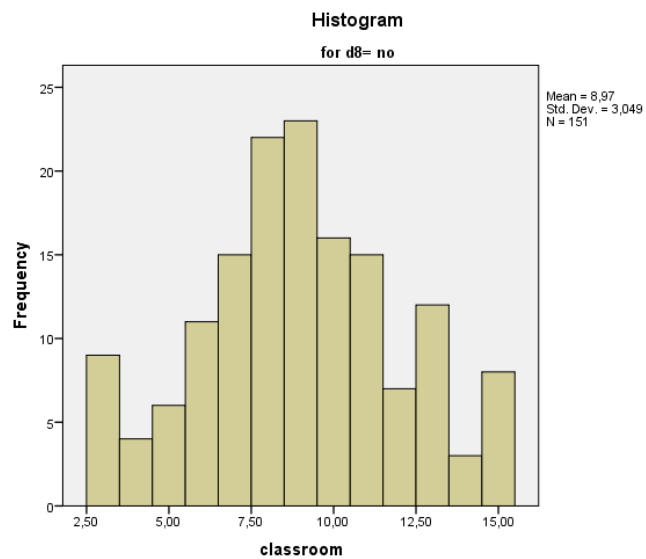


Figure 31. Histogram of classroom scores of the teachers who did not read a book or an article

The homogeneity of the data was controlled with Levene's Test. The results constituted that the variances of groups were equal; $F(1,196) = 3.55, p > .05$.

After all the assumptions were checked, independent samples *t*- test was conducted. The results showed that there was no significant difference between perception of the teachers who read a book or an article about dyslexia ($M = 8.47$, $SE = .52$) and perception of the teachers who did not read a book or an article about dyslexia ($M = 8.97$, $SE = .25$); $t(196) = .94$, $p > .05$; it represented small effect size, $d = .15$. Table 21 shows the results.

Table 21. Independent Sample Test of Teachers' Classroom Scores with Regard to Reading a Book or an Article

	Teachers who read a book or an article			Teachers who did not read a book or an article			<i>t</i> -value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Classroom	8.47	3.60	0.52	8.97	3.05	0.25	.94	.15

4.5.5 The difference between teachers' perception of dyslexic students' classroom behaviors with regard to teaching a student with dyslexia

Sub-research question 6 d) states whether there is a significant difference between primary school teachers' perception of dyslexic students' classroom behaviors with regard to teaching a student with dyslexia. In order to answer the research question independent sample *t*- test was conducted. Before the *t*- test was conducted, the assumptions of the test were controlled.

Normality of the data was controlled based on the kurtosis and skewness values. The kurtosis value for the teachers who taught a student with dyslexia was .69 and for the teachers who did not teach a student with dyslexia was -.49. The skewness value was .02 for the teachers who taught a student with dyslexia and -.02 for the teachers who did not teach a student with dyslexia. These values are acceptable. Histograms were also drawn to control the distribution of the data. Figure 32 represents the histogram of the teachers who taught a student with dyslexia and figure 33 represents the histogram of the teachers who did not teach a student with dyslexia

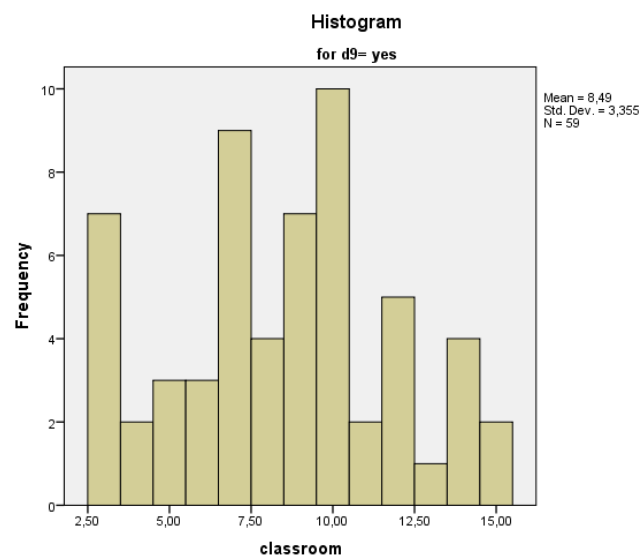


Figure 32. Histogram of classroom scores of the teachers who taught a student with dyslexia

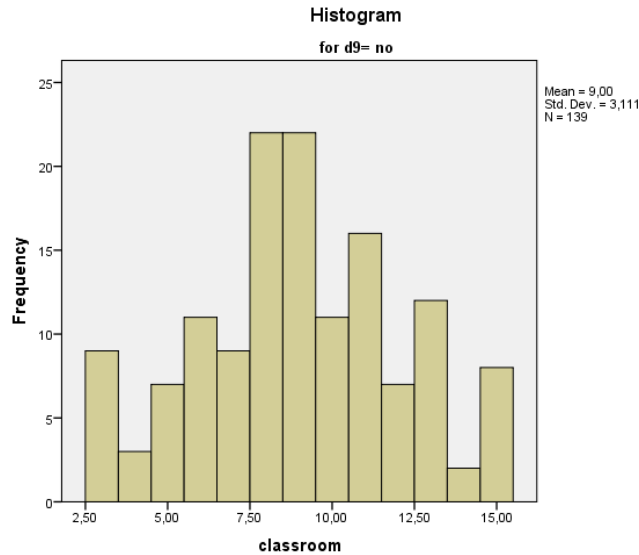


Figure 33. Histogram of classroom scores of the teachers who did not teach a student with dyslexia

The homogeneity of the data was controlled with Levene's test. The test results showed that the variances of the groups were equal; $F(1,196) = .97, p > .05$

After all the assumptions were controlled, independent samples *t*- test was carried on. The results showed that there was no significant difference between perception of dyslexic students' classroom behaviors of the teachers who taught a student with dyslexia ($M = 8.49, SE = .44$) and perception of dyslexic students' classroom behaviors of the teachers who did not teach a student with dyslexia ($M = 9.00, SE = .26$); $t(196) = 1.03, p > .05$; it represented small effect size, $d = .15$.

Table 22 shows the results.

Table 22. Independent Samples Test of Teachers' Classroom Scores with Regard to Teaching a Student with Dyslexia

	Teachers who taught a student with dyslexia			Teachers who did not teach a student with dyslexia			<i>t</i> - value	Effect Size
	M	SD	Std. Error	M	SD	Std. Error		
Classroom	8.49	3.35	0.44	9.00	3.11	0.26	1.03	.15

CHAPTER 5

DISCUSSION AND CONCLUSION

This research is one of the investigations that has developed a scale on primary school teachers' knowledge and perception of dyslexia and examined teachers' knowledge and perception through this scale. This study also explored the factors that predict teachers' knowledge and perception of dyslexia. This chapter includes the discussion of the results and is organized around the research questions. The first part includes the discussion of the findings about teachers' knowledge of dyslexia. The second part includes the discussion of the findings about teachers' perception of dyslexia and the discussion of the findings about teachers' perception of dyslexic students' classroom behaviors. Finally, the last part includes limitations and recommendations for future research.

The aim of the present study is two-fold. Firstly, it attempts to develop a scale to measure primary school teachers' knowledge and perception of dyslexia. Secondly, it aims to explore teachers' knowledge and perception of dyslexia through this scale. A student with dyslexia needs a high qualified and well trained instructor to expand his or her capabilities. Therefore teachers' knowledge of dyslexia is significantly important. Also, teachers' perception of dyslexia effects their knowledge of dyslexia. Not only teachers' knowledge, but also dyslexic students' own self-confidence is affected by teachers' perception of dyslexia.

Accordingly, a scale has been developed to explore what primary school teachers know about dyslexia and what their perceptions of dyslexia are. The scale includes ten items reflecting accurate knowledge related to knowledge of dyslexia,

six items about perception of dyslexia and three items related to teachers' perception of dyslexic students' classroom behaviors. Since these three items were related to perception, they were discussed under the title of primary school teachers' perception of dyslexia.

5.1 Primary school teachers' knowledge of dyslexia

The study investigated primary school teachers' knowledge of dyslexia and teachers were asked if they had heard about dyslexia or not. Most of the teachers answered as yes (81%). On the other hand 19% of the teachers indicated that they had not heard about dyslexia before. The results markedly showed that not all the primary school teachers who participated in the study heard the term dyslexia. This finding is consistent with the ones which Bingöl (2003) reported that teachers are not aware of the term dyslexia. Taking into consideration that teachers have great importance to distinguish dyslexia, it is crucial to note that every teacher should be aware of dyslexia and have accurate knowledge of it. When primary school teachers' knowledge of dyslexia was investigated, it was seen that on average, teachers had accurate knowledge of dyslexia. On the other hand, the teachers who have misconceptions about dyslexia and do not have accurate knowledge of dyslexia should be taken into consideration. In this respect the study has similar findings with Washburn et al. (2011a) reporting that teachers have both valid and invalid knowledge about dyslexia.

Primary school teachers' knowledge of dyslexia was investigated with regard to teaching experience. The results showed that there was not a significant relation between teachers' knowledge of dyslexia and their teaching experience. In other

words, teachers' knowledge of dyslexia does not increase as the years they spend in teaching increases. Our finding is in line with the study of Doğan (2013).

Doğan (2013) revealed that novice teachers were much more knowledgeable about dyslexia than experienced teachers. Contradictory finding comes from Ferrer et al. (2016). According to the results of their study, long years of teaching provide teachers with different sources of knowledge about dyslexia. As it can be understood from the discordant findings, teaching experience is not a significant factor related to teachers' knowledge.

One important finding of the study showed that the majority of the teachers (83%) did not think that they had sufficient academic knowledge to teach a student with dyslexia. This finding is consistent with other studies (Altun et al., 2011; Altuntaş, 2010; Bell et al., 2011; Moreau, 2014; Polat et al., 2012) reporting that vast majority of the teachers were not capable of teaching students with dyslexia. One possible reason why primary school teachers feel inadequate to teach dyslexic students might result from teacher training programs. Most of the teachers did not feel well prepared to teach dyslexic students and did not have adequate and accurate knowledge of dyslexia because most of them did not take a course about dyslexia during their university education. According to Ferrer et al. (2016) the fact that teachers lack accurate knowledge of dyslexia is directly related to university coursework, university text books and the professional development courses.

One of the important findings that the present study showed is that only a small percentage of the teachers took a course about dyslexia during their university education (12.9%). The large amount of the teachers did not take a course about dyslexia (87.1%). This is consistent with the findings of Ferrer et al. (2016) reporting

that teachers lack accurate knowledge of dyslexia because they did not have the opportunity to take a course about dyslexia during their university education.

The results revealed that there was no significant difference between teachers' knowledge of dyslexia with regard to taking a course during university education. This finding was supported by other studies (Moreau, 2014; Polat et al., 2012; Washburn et al., 2014). These studies showed that the vast majority of the teachers did not take a course about dyslexia. Therefore, their knowledge of dyslexia does not differ with regard to taking a course. On the other hand, Doğan (2013) reported that teachers who took a course about dyslexia during university education have higher level of knowledge of dyslexia than the teachers who did not take a course. It is revealed that dyslexic students' achievement is positively related to teachers' quality and teachers' quality is related to professional training they had. (Doğan, 2013). Therefore, taking a course about dyslexia is significantly important and teaching programs should include courses about dyslexia (Bos et al., 2001).

Teachers' professional development starts with the courses taken during university education and continues throughout their professional lives. Primary school teachers should continue to develop themselves by taking in-service seminars while they are in-service. In the present study similar to taking a course, only a small percentage of the teachers took in-service seminar about dyslexia (6.5%). The vast majority of the teachers did not take in-service seminar (93.5%). Therefore, the findings revealed that there was not a significant difference between teachers' knowledge of dyslexia with regard to taking an in-service seminar. The results are consistent with Akçay (2014). According to Akçay, elementary teachers' awareness level does not differ with regard to taking in-service seminar. Teachers report that they need additional training about dyslexia and they lack the support they need to

teach students with dyslexia (Polat et al., 2012). In order to support teachers, in-service seminars should be offered to them.

Teachers' knowledge of dyslexia is not only based on the courses taken during university education or in-service seminars but also the books or articles they have read. Teachers should continue their professional development by reading books or articles. One surprising finding of the present study is that, most of the teachers (75.6%) have not read a book or an article about dyslexia. Whereas only 24.4% of the teachers indicated that they read a book or an article about dyslexia. It is found that there was not a significant difference between teachers' knowledge of dyslexia with regard to reading a book or an article about dyslexia. This result is mostly due to the teachers' insufficient level of reading. This finding of the present study highlights that besides being lack of support provided by environmental factors such as taking a course or taking an in-service seminar, teachers themselves are lack of inner motivation to train themselves about dyslexia. This is consistent with Moreau (2014) suggesting that teachers should be motivated for professional development.

Another interesting finding of the study is related to teaching a student with dyslexia. The results showed that there was not a significant difference between teachers' knowledge of dyslexia with regard to teaching a student with dyslexia. In other words, the knowledge of the teachers who have taught a student with dyslexia did not differ from the knowledge of the teachers who have not teach a student with dyslexia. This result is consistent with the results of the study conducted by Altuntaş (2010) reporting that teaching a student with dyslexia does not contribute to teachers' knowledge. On the other hand, these findings are inconsistent with the findings of Ferrer et al. (2016). They reported that teachers' knowledge about dyslexia was

related to being exposed to a student with dyslexia. The difference between the findings is due to the fact that teachers who participated in the present study did not have students identified as dyslexic. The majority of the teachers (70.1%) indicated that they did not teach a student with dyslexia before. A small percentage (29.9%) of the teachers stated that they had taught a student with dyslexia. This finding reveals that most of the students with dyslexia have not been identified by their teachers yet. Similar finding is reported by Doğan (2013). In her study, she reported about a primary school teacher with 15 years of teaching experience who had not taught a dyslexic student yet. This noteworthy finding highlights the fact that primary teachers' knowledge of dyslexia is not enough to recognize the students with dyslexia.

5.2 Primary school teachers' perception of dyslexia and dyslexic students' classroom behaviors

This part of the study includes the discussion about the results of primary school teachers' perception of dyslexia and their perception of dyslexic students' classroom behaviors.

The findings of the study showed that primary school teachers mostly had positive perception of dyslexia. Most of the teachers (64%) thought that students with dyslexia could be successful just as the others. Teachers thought that dyslexic students can overcome the effects of dyslexia. All of these findings show that primary school teachers had positive perceptions of dyslexia. They did not perceive students with dyslexia as unsuccessful learners. This is an important finding to note because there is a link between teachers' perceptions of dyslexia and students'

performance (Hornstra et al., 2010). Negative perception and low expectations affect dyslexic students' performance negatively. The present study revealed that vast majority of the teachers had positive perception of dyslexia which has a positive effect on dyslexic students' performance as Hornstra et al. (2010) suggested.

Primary school teachers' perception of dyslexia was investigated with regard to their teaching experience. The results showed that there was a positive relationship between teachers' perception of dyslexia and their teaching experience. In other words, as the years of teaching increases, teachers are more likely to have positive perception of dyslexia and students with dyslexia. This finding of the present study is consistent with Yiğiter (2005). Yiğiter (2005) reported that teachers' knowledge of learning disabilities varies on the basis of teaching experience.

Primary school teachers' perception of dyslexia changed with regard to taking a course about dyslexia. This finding is consistent with some of the earlier studies that found that every teaching education program should include courses about dyslexia because the teachers who take a course about dyslexia are more likely to meet the needs of the students who have special needs including students with dyslexia (Bos et al., 2001; Hornstra et al., 2010).

There was no significant difference between teachers' perception of dyslexia with regard to taking in-service seminar about dyslexia and reading a book or an article about dyslexia. The study is inconsistent with Yiğiter (2005). Yiğiter (2005) reported that teachers who receive training about dyslexia have more positive perception of inclusive education. The contradiction between the findings may stem from the fact that most of the teachers who participated in the present study did not take an in-service seminar about dyslexia (93.5%), and most of them did not read a

book or an article about dyslexia (75.6%). Studies reported that professional development and teacher qualification has an effect on teachers' perception of dyslexia (Bos et al., 2001; Hornstra et al., 2010). If the teachers receive training about dyslexia, they have more positive perception of inclusive education (Yiğiter, 2005). Also it is reported that teachers who received formal or informal training about dyslexia have more positive perception of individualized teaching than the teachers who did not receive training about dyslexia (Hornstra et al., 2010).

Primary school teachers' perception of dyslexia did not differ with regard to teaching a student with dyslexia. This finding is inconsistent with the findings of Yiğiter (2005). Yiğiter reported that teachers' perception of inclusive education differs according to being familiarized with someone who has dyslexia. The difference between the results of the present study and Yiğiter (2005) is mostly due to the small percentage of teachers who have taught a student with dyslexia (29.9%) in the present study. In other words, the majority of the teachers who participated in the study have not teach to a student with dyslexia yet (70.1%). This also means that most of the students who have dyslexia have not been distinguished by their teachers yet.

Teachers' perception of dyslexic students' classroom behaviors varies. Most of the teachers showed strong disagreement regarding the item that states students with dyslexia always have excessive physical activity in the classroom (43%). Most of the teachers (41%) indicated that students with dyslexia might have integration problems in the classroom. Nonetheless teachers did not have a positive or negative perception of students with dyslexia related to classroom rules. The percentage of the teachers who showed strong agreement (33%) was equal to the percentage of the teachers who showed strong disagreement regarding the item that states students with

dyslexia have difficulties in following the classroom rules (33%). These three items were related to classroom atmosphere. Although teachers' perception of dyslexic students is positive, it is obvious that teachers are confused with dyslexic students' classroom behaviors. To solve the confusion, it is suggested to provide to primary school teachers ongoing professional development about programs, new tools, resources about teaching dyslexic students (Bell et al., 2011). Also the findings of the present study revealed the need of teacher training about dyslexia in order to have positive perception of students with dyslexia.

When primary school teachers' perception of dyslexic students' classroom behaviors was examined, it was seen that there was no significant relationship between teachers' perception of dyslexic students' classroom behaviors and their teaching experience. This is inconsistent with Yiğiter (2005). According to Yiğiter (2005) experienced teachers have more positive perception than the inexperienced teachers.

Also there was no significant difference between teachers' perception of dyslexic students' classroom behaviors with regard to independent variables of the study which were a. taking a course about dyslexia, b. taking an in-service seminar about dyslexia, c. reading a book or an article about dyslexia, d. teaching a student with dyslexia. These findings may due to small percentages of teachers who took a course, took an in-service training, read a book or an article about dyslexia and taught a student with dyslexia. Teachers' perception of dyslexic students' classroom behaviors showed that teachers had pre-perceptions of dyslexic students' classroom behaviors because the majority of the teachers did not have an experience with dyslexia. One possible cause of teachers' negative perception of dyslexic student's classroom behaviors may rely on teachers' classroom management abilities. A

teacher should have high level of abilities related to classroom management in order to manage a dyslexic student in classroom environment. It is reported that teachers' understanding of dyslexia and their perception of dyslexic students differ with regard to their individual training about dyslexia (Washburn et al., 2014). On the other hand, the present study is inconsistent with Washburn et al. (2014) in that manner, because the vast majority of the teachers indicated that they did not take adequate training about dyslexia.

Overall, the results of the present study revealed that although the majority of the primary school teachers thought that they did not have sufficient academic knowledge to teach a student with dyslexia, they had moderate level of knowledge of dyslexia and their knowledge did not differ with regard to teaching experience. Also their knowledge did not differ with regard to a. taking a course about dyslexia, b. taking in-service seminar about dyslexia, c. reading a book or an article about dyslexia and d. teaching a student with dyslexia.

Also teachers mostly have positive perception of dyslexia. Their perceptions of dyslexia differed with regard to teaching experience and taking a course about dyslexia. On the other hand, their perception of dyslexia did not differ with regard to a. taking in-service seminar about dyslexia, b. reading a book or an article about dyslexia and c. teaching a student with dyslexia. Additionally, teachers mostly had negative perception of dyslexic students' classroom behaviors and their perception of dyslexic students' classroom behavior did not change with regard to a. teaching experience, b. taking a course about dyslexia, c. taking in-service seminar about dyslexia, d. reading a book or an article about dyslexia, and e. teaching a student with dyslexia. This study also showed that primary school teachers were not given professional support of taking a course or in-service seminar about dyslexia.

5.3 Limitations and recommendations

The present study had some limitations due to various reasons. One of the reasons was sampling technique. Convenience sampling technique was used therefore the results of the study cannot be generalized to entire primary school teachers.

Furthermore, the scale has limited items related to teachers' knowledge of dyslexia and their perception of dyslexia. The scale should include more items about teachers' knowledge and perceptions. It was a 5 point Likert scale with statements about dyslexia and dyslexic students. Using an open ended questionnaire or interview may have provided more detailed data about knowledge and perceptions of teachers.

However, with the present study, important insight into primary school teachers' knowledge of dyslexia and their perception of dyslexia is provided. The study revealed that primary school teachers had moderate level of knowledge of dyslexia and mostly had positive perception of dyslexia. On the other hand, their knowledge and perceptions do not stem from their professional training or experience with a dyslexic student. Further studies can be conducted with open ended items to get a deeper insight about primary school teachers' knowledge and perception of dyslexia and about the resource of their knowledge and perception. Also with the present study, it was seen that teacher education programs should provide courses about dyslexia and in-service trainings should be held. Teachers should be provided with the opportunities to develop their professional development in order to have accurate knowledge about dyslexia and positive perception of dyslexia.

Providing teachers with professional development opportunities such as courses, in-service trainings, work-shops will help teachers to enhance their

knowledge of dyslexia and to have positive perception of dyslexia. A knowledgeable teacher about dyslexia is more likely to distinguish students with dyslexia. It is important to note that dyslexic students can expand their capabilities if they are diagnosed as early as possible.

APPENDIX A

TEACHERS' KNOWLEDGE AND PERCEPTION SCALE

DEMOGRAPHIC QUESTIONS:

A. Gender: ☐ Male ☐ Female

B. Teaching Experience years

C. Education Status ☐ 2 years degree ☐ Bachelor degree ☐ Master degree

D. Type of faculty ☐ Education Faculty
☐ Other (Please note)

E. Have you heard about dyslexia before ? Yes ☐ No ☐

F. Did you take a course about dyslexia during your university education? Yes ☐ No ☐

G. Have you ever taken an in-service seminar about dyslexia? Yes ☐ No ☐

H. Have you ever read a book or an article about dyslexia ? Yes ☐ No ☐

I Have you taught a student with dyslexia yet ? Yes ☐ No ☐

J. Do you think that you have sufficient academic knowledge to teach
a student with dyslexia? Yes ☐ No ☐

QUESTIONNAIRE:

There is no wrong or correct answers for the items in this scale. Please read carefully every item and choose one of the numbers according to your agreement level for each item.

Strongly disagree: 1 Disagree: 2 Neither agree nor disagree: 3 Agree: 4 Strongly agree: 5

		1	2	3	4	5
1	Dyslexia is a reading difficulty.					
2	A student with dyslexia experiences difficulties in listing the alphabet correctly.					
3	A student with dyslexia experiences difficulties in reading words.					
4	A student with dyslexia experiences difficulties in differentiating directions (for example up-down, right-left).					

		1	2	3	4	5
5	A student with dyslexia experiences difficulties in differentiating time concepts (for example before, after, yesterday, tomorrow)					
6	A student with dyslexia experiences concentration and attention difficulties.					
7	A student with dyslexia experiences difficulties in remembering what he/she has read.					
8	A student with dyslexia experiences difficulties in remembering the shapes of letters.					
9	A student with dyslexia experiences difficulties in doing two different things simultaneously such as listening the teacher and writing.					
10	A teacher should understand what dyslexia is.					
11	A student with dyslexia needs to read the same paragraph again and again.					
12	A student with dyslexia experiences difficulties in remembering the seasons and months in order.					
13	A student with dyslexia experiences difficulties in spelling.					
14	A student with dyslexia experiences difficulties in using punctuation marks properly.					
15	A student with dyslexia experiences difficulties in organizing his or her notebook.					
16	A student with dyslexia skips the lines while reading.					
17	A student with dyslexia experiences difficulties in differentiating mathematical symbols, concepts and geometric forms.					
18	A student with dyslexia may often jumble the letters and words.					
19	Dyslexia is a disease.					
20	Dyslexia should be treated with medicine.					
21	A student with dyslexia should not receive education with other students.					
22	A student with dyslexia should not receive education in an inclusive classroom.					

		1	2	3	4	5
23	A student with dyslexia only benefits from individualized teaching methods.					
24	A student with dyslexia cannot achieve academic tasks that other students achieve.					
25	Early diagnosis of dyslexia has positive results for the student.					
26	Teachers are significantly important for early diagnosis of dyslexia.					
27	Dyslexia affects the child in a way that cannot be remediable.					
28	A student with dyslexia does not only fail academically but also in sports and arts.					
29	Dyslexia is related to genetics.					
30	Dyslexia is a developmental disorder.					
31	Dyslexia is not an impairment of sense organs.					
32	A student with dyslexia has a poor short term memory.					
33	A student with dyslexia may suffer from low self-confidence.					
34	A student with dyslexia experiences difficulties related to his or her cognitive abilities.					
35	Having a student with dyslexia does not disturb me.					
36	A student with dyslexia experiences difficulties in following classroom rules.					
37	A student with dyslexia has consistently excessive physical activity.					
38	A student with dyslexia experiences difficulties in accommodating classroom atmosphere.					
39	I know how to communicate with a student who has dyslexia.					
40	Having a student with dyslexia causes additional work load for me.					
41	Dyslexia is mostly seen in young children.					
42	A student with dyslexia experiences difficulties in understanding what is said to him or her.					

		1	2	3	4	5
43	A student with dyslexia experiences difficulties in writing his or her ideas in a cohesive manner.					
44	Dyslexia affects the students' academic life negatively.					
45	A student with dyslexia may become a successful individual in the future.					
46	I can differentiate a student who exhibits signs of dyslexia.					
47	A student with dyslexia does not experience difficulties in finding the proper words while speaking.					
48	There is nothing called as dyslexia, it is just another name of laziness.					
49	A student with dyslexia has no difficulty in academic tasks except learning to read.					
50	Only dyslexia experts can teach a student with dyslexia.					
51	I can differentiate students who have dyslexia and who have learning difficulties.					
52	A student with dyslexia should be given extra time in exams.					
53	A student with dyslexia knows the sounds and the names of the letters.					
54	A student with dyslexia should receive education in special schools.					
55	A student with dyslexia experiences difficulties in math.					
56	Classroom teacher is responsible for education of a student with dyslexia.					

APPENDIX B

TOTAL VARIANCE AND EIGENVALUES OF FIRST FATOR ANALYSIS

Factor	Initial Eigenvalues			Extraction Sums of Squared			Rotation Sums of Squared		
	Loadings			Loadings			Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8,250	14,732	14,732	7,852	14,021	14,021	6,634	11,847	11,847
2	4,271	7,627	22,359	3,846	6,868	20,889	3,541	6,324	18,171
3	3,495	6,242	28,601	3,059	5,462	26,351	1,972	3,521	21,692
4	3,187	5,690	34,291	2,730	4,874	31,225	1,844	3,293	24,985
5	2,278	4,068	38,359	1,839	3,285	34,510	1,823	3,256	28,241
6	2,113	3,773	42,132	1,643	2,935	37,445	1,796	3,208	31,449
7	1,900	3,393	45,525	1,485	2,652	40,097	1,778	3,175	34,624
8	1,807	3,227	48,752	1,398	2,497	42,594	1,586	2,832	37,456
9	1,576	2,814	51,566	1,126	2,010	44,605	1,481	2,644	40,100
10	1,494	2,668	54,234	1,063	1,899	46,503	1,425	2,546	42,645
11	1,372	2,450	56,684	,954	1,703	48,207	1,354	2,417	45,063
12	1,327	2,369	59,053	,919	1,642	49,848	1,317	2,353	47,415
13	1,255	2,242	61,295	,818	1,462	51,310	1,167	2,085	49,500
14	1,217	2,174	63,469	,781	1,394	52,704	1,149	2,051	51,551
15	1,097	1,960	65,429	,684	1,221	53,925	,949	1,694	53,245
16	1,083	1,934	67,363	,605	1,079	55,005	,812	1,451	54,696
17	1,012	1,808	69,171	,572	1,022	56,027	,745	1,331	56,027
18	1,000	1,785	70,956						
19	,918	1,640	72,596						
20	,863	1,541	74,136						
21	,831	1,484	75,620						
22	,766	1,367	76,987						
23	,750	1,339	78,327						
24	,730	1,303	79,630						
25	,695	1,241	80,871						
26	,662	1,182	82,052						
27	,611	1,090	83,143						
28	,576	1,028	84,171						
29	,563	1,005	85,176						
30	,540	,964	86,140						
31	,534	,953	87,093						

32	,514	,918	88,011					
33	,477	,852	88,863					
34	,462	,826	89,689					
35	,424	,757	90,446					
36	,413	,737	91,183					
37	,399	,712	91,895					
38	,378	,675	92,570					
39	,374	,668	93,239					
40	,357	,638	93,877					
41	,325	,580	94,457					
42	,308	,550	95,007					
43	,293	,523	95,530					
44	,286	,510	96,040					
45	,263	,470	96,510					
46	,247	,442	96,952					
47	,243	,434	97,386					
48	,223	,398	97,783					
49	,186	,332	98,115					
50	,184	,329	98,444					
51	,182	,326	98,770					
52	,163	,291	99,061					
53	,155	,277	99,338					
54	,144	,257	99,594					
55	,123	,220	99,814					
56	,104	,186	100,000					

Extraction Method: Principal Axis Factoring.

APPENDIX C

ROTATED FACTOR MATRIX OF FIRST FACTOR ANALYSIS

	Factor																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
q15	,725																
q13	,714																
q11	,690																
q9	,686																
q16	,664																
q8	,662																
q14	,655																
q18	,638																,303
q7	,587																
q3	,583																
q6	,577									,306							
q2	,567				-,313												
q5	,563																
q12	,556	,316															
q4	,495																
q17	,479																
q26	,445	-,404															
q23	,429	-,318															
q1	,403							-,362		,336							
q28		,716															
q24		,657															
q19		,591											,310				
q25	,321	-,549															
q20		,518															
q27		,509															
q21		,419													,343		
q37		,376			-,306												
q36		,327			-,310												
q35		-,302															
q42			,588														
q43			,456														
q55			,438														
q40			,427														
q33			,415			,396		,325									
q52			,412														
q32			,387			,364											
q50			,380		,306												

q49			,366	,326		-,314										
q48			,365													
q38		,335	-,362	,326				,348			,339					
q45				,581												
q41				,580												
q44				,552												
q51				,513					,347							
q46				,483												
q56				,367												
q10	,328				,554											
q34			,396		-,481											
q31					,321											
q22						,333										
q39						-,325										
q30							,549					,317				
q47							,309									
q54			,332			-,326	-,397			,363						
q29									,323							
q53			,303			-,304			-,306							

Extraction Method: Principal Axis Factoring.

a. 17 factors extracted. 20 iterations required.

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