Available online at ijci.wcci-international.org

International Journal of Curriculum and Instruction 13(3) (2021) 3096–3121

IJCI
International Journal of Curriculum and Instruction

Teachers' knowledge about dyslexia and reading models

Özlem Altındağ Kumaş [a], Halime Miray Sümer Dodur [b], Tansel Yazıcıoğlu [c]

[a] [a] *Dicle University, Ziya Gökalp Faculty of Education Diyarbakır, Turkey*
[b] *Nevşehir Hacı Bektaş Veli University, Faculty of Education, Nevşehir, Turkey,*
[c] *Nevşehir Hacı Bektaş Veli University, Faculty of Education, Nevşehir, Turkey*

Abstract

Dyslexia is a phenomenon that recently has been recognized socially and attracted the attention of educators in Turkey. For this reason, in Turkey, scientific research on dyslexia is quite limited and teachers lack sufficient knowledge. The purpose of this study was to examine the dyslexia-related knowledge and beliefs of teachers, who have in their classrooms students with dyslexia, and to identify which reading approaches these teachers used. The quantitative data of the study was obtained from 400 and the qualitative data was obtained from 40 classroom teachers. The Scale of Knowledge and Beliefs about Developmental Dyslexia was applied to identify the knowledge and beliefs of teachers about dyslexia and the Development of the Teachers' Beliefs About Literacy Questionnaire to identify their reading approaches. The qualitative and quantitative results together show that teachers have common misconceptions about dyslexia and use the teacher-centered bottom-up reading approach.

Keywords: dyslexia, reading models, Turkish teacher, teacher knowledge**.**

1. Introduction

Reading is one of the most important skills in a modern person's life and plays a major role in academic success. The majority of children perceive and acquire reading skills within a natural process of education. However, it is reported that about 10% of elementary school children have difficulty learning reading despite having normal intelligence, favorable educational opportunities, and not having any emotional problems. These children are diagnosed with dyslexia.

1.1.Defining dyslexia

Dyslexia is neurobiological and genetic in origin and characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities

(International Dyslexia Association [IDA] 2002; Wajuihian, 2012). In other words, dyslexia is a brain-based disorder that causes varying degrees of deficits in comprehension and fluency. The difficulties experienced by students with dyslexia are often caused by a phonological deficit. Phonological deficit leads to the lack of ability to match graphemes with phonemes, which is the difficulty of decoding written words. It is noted that the phonological deficits in dyslexia develop in pre-school years before learning reading starts (Morais & Kolinsky, 2005; Snowling, Nash, Gooch, Hayiou-Thomas & Hulme, 2019). Children with dyslexia have difficulty in decoding words, reading fluently, generalizing skills (reading new words they have never seen before), auditory short-term memory and rapid automized naming skills (Gooch, Snowling & Hulme, 2011). Dyslexia does not mean having poor reading skills. While poor reading skills may be associated with economic disadvantages, unfavorable conditions, lack of motivation, and low intelligence score, this is not the case for individuals with dyslexia (Beckman, Messersmith, Shepard & Cates, 2012).

Although dyslexia have been much more visible recently due to social media, awareness-raising activities, publications and studies, there are still many common misconceptions attached to it. A very common misconception is that dyslexia is caused by the lack of visual perception (Washburn, Binks-Cantrell & Joshi, 2013; Williams & Lynch, 2010). Based on this misconception, the fact that children write letters backward is considered the only predictor of dyslexia. Another misconception is that children with dyslexia have below-average intelligence. However, research has shown that children with dyslexia have average and above-average intelligence (Norton, Beach & Gabrieli, 2015). Another common misconception is that the use of colored overlays is an effective method for children with dyslexia. Research has shown that such practices are not effective (Lovino, Fletcher, Breitmeyer & Foorman,1998).

1.2. Turkey and Dyslexia

Turkish has a transparent orthography and one-to-one correspondence between the graphemes and the phonemes. Even though there are only a few studies examining the word decoding skills of Turkish-speaking children, it was reported that the reading and spelling skills of these children develop much faster than of English-speaking children (Öney & Durgunoğlu, 1997), and they are much accurate in decoding meaningful (Durgunoğlu & Öney, 1999) and meaningless words (Öney & Goldman, 1984). This indicates the superiority of Turkish, which has correspondence between graphemes and phonemes, over English with regard to success in decoding. However, a 10-month longitudinal study by Caravolas et al. (2012) found that phonemic awareness and grapheme-phoneme knowledge were the predictors of decoding for all languages with or without transparent orthographies. Comparative studies also found no significant

difference between the experience of children with dyslexia who speak languages with and without transparent orthographies (Paulesu; et al., 2001; Soriona & Miranda, 2010).

Due to the lack of standards and awareness of dyslexia diagnosis in Turkey, its prevalence cannot yet be known with accuracy (Melekoglu & Sak, 2018). Literature notes that the prevalence of dyslexia among school-age children could be 7 to 16% (Peterson & Pennington, 2015). In Turkey, the average classroom size in public elementary schools is 26 and the number of students per teacher is 17 (ERG, 2019). Considering these figures, it is estimated that there are one to five students with dyslexia in every classroom. Given the lifelong effects of dyslexia, it is vital for teachers to perfectly understand what dyslexia is and to adopt the best methods so that such students are supported in the best way possible.

1.3.Teaching reading approaches used in Turkey and the effects of these approaches on dyslexia

Various models have been put forward to describe the process of reading. The most common ones are the bottom-up (Gough, 1972), top-down (Goodman, 1967), and interactive (Stanovich, 1980) reading models.

In the bottom-up model, the reader achieves meaning by recognizing the letters first, then words, and then sentences (Gunning, 2008). First, readers are taught letters. Then, syllables are formed from letters, words from syllables and sentences from words. The limitation of this method is that learners cannot quickly abandon spelling whilst reading and frequently resort to it. In addition, the meaning does not occur as desired since readers concentrate on letters and syllables. It has been reported that it is particularly difficult for children with dyslexia to combine letters after they are taught individually, due to the fact that consonants in the Turkish alphabet are not pronounced by themselves, and that this method does not give positive outcomes (Durukan & Alver, 2008; Erkul & Erdoğan, 2009; Gün, 2006; Özsoy, 2006).

On the other hand, the top-down model explains that comprehension is as natural as learning how to speak and it begins with the reader's preliminary knowledge. The student starts reading meaningful sentences. Sentences are then divided into words, words into syllables, and syllables into sounds (letters), trying to make sense of the sounds of letters. The limitation of this method is that it is time-consuming and delays reading.

The interactive model combines top-down and bottom-up reading models simultaneously (Verhoevan & Perfetti, 2008). According to the interactive model, reading comprehension is a dynamic and interactive process that includes the reader, text, reading actions and sociocultural context (Guthrie, 2002) The process is kicked off by making predictions about the meaning or decoding of graphic symbols. Readers make

predictions based on the interaction of the information, which is being processed (Gunning, 2008).

In 2004, the Turkish Ministry of National Education made an amendment to the Turkish language curriculum changing the approach used for teaching reading. The sentence-based method of the top-down reading approach was replaced by the phonics-based method of the bottom-up reading approach. Although teachers are required to use the phonics-based sentence method in the classroom, some teachers use both methods (Erkul & Erdogan, 2009).

Since Turkish has a transparent orthography, it is suggested that comprehending phonemes would not be very challenging in the phonics-based sentence model (Onan, 2009). Demirel (2006) noted that the phonics-based sentence method is appropriate for the level of development of students and increases their self-confidence. Ferah (1999) emphasized the positive aspects of the phonics-based sentence model thanks to the fact that in Turkish, there is a one-to-one relationship between graphemes and phonemes, each grapheme has its own phoneme, and there is transparent orthography. On the other hand, Şahin, İnci and Turan's (2006) study concluded that students made more agglutination mistakes when learning using the phonics-based sentence method due to the fact that Turkish is an agglutinative language. In their study, Güzel Özmen and Doğan (2009) concluded that Turkish students who learn reading and writing using the phonics-based sentence method make more reading mistakes than students who learn using the decoding method. In her study in Turkey, Karamuklu (2018) found that the sentence decoding method was more effective for students with dyslexia compared to the phonics-based sentence method in reading and writing letters, syllables, words and sentences. The international literature reports that the bottom-up reading model significantly improves the reading skills of students experiencing reading difficulties (Foorman, Breier & Fletcher, 2003; Hatcher, Hulme & Snowling, 2004; Helland, Tjus, Hovden, Ofte & Heimann, 2011).

1.4. Teachers' beliefs about dyslexia and reading teaching models

In reading difficulties, early intervention is of vital importance for children at risk and often it is classroom teachers who first identify this problem (Wadlington & Wadlington, 2005). Teachers' beliefs about the reading process and how children acquire literacy skills fail them to adapt their teaching approaches for students with learning difficulties (Westwood, Knight & Redden, 1997).

Bos, Mather, Dickson, Moats and Lyon (1996) note that teachers' knowledge about literacy teaching predicts the reading performance of students with dyslexia. Insufficient knowledge of effective literacy teaching also leads to social and emotional problems by reducing the academic performance of students who have reading difficulties (Currie & Wadlington, 2000; Shaywitz, 2003).

Dyslexia is a phenomenon that recently has been recognized socially and attracted the attention of educators in Turkey (Sümer Dodur & Altındağ Kumaş, 2020). For this reason, scientific research in the field of dyslexia is currently quite limited. A research by Balcı (2019) examined the beliefs of teachers in Turkey on dyslexia. The Semi-Structured Teacher Interview Form was used for data collection. The research found that teachers are not sufficiently trained about dyslexia during undergraduate training and they do not consider the training they received to be sufficient. The results showed that participants' level of knowledge about dyslexia was quite low; that the level of knowledge about dyslexia is not affected by age and education levels of the participants; female participants were more knowledgeable about dyslexia than male participants. The purpose of Doğan's (2013) study was to identify the level of knowledge of classroom and Turkish language teachers about dyslexia. The researcher developed a tool to identify the level of knowledge of teachers about dyslexia. The study found the knowledge of teachers about dyslexia to below. Sümer Dodur & Altındağ Kumaş (2020) examined the knowledge of classroom teachers about dyslexia using a valid and reliable scale. The results showed that classroom teachers were not knowledgeable enough about dyslexia and did not feel ready to teach students with dyslexia. No study was found that examines the knowledge of teachers, who have students diagnosed with dyslexia in their classroom, and the reading models these teachers use. The limited number of studies cause teachers, who lack knowledge about dyslexia, to feel professionally inadequate (Balcı, 2015). Therefore, teachers fail to effectively help out students with dyslexia, which has a negative impact on such students in terms of academic performance and school attendance (Seidenberg, 2013).

The purpose of this study was to examine the dyslexia-related knowledge and beliefs of teachers, who have in their classroom's students with dyslexia, and to identify which reading approaches these teachers to use.

2.Method

2.1. Research Design

This research adopted the mixed research method, which combines qualitative and quantitative methods, approaches and concepts (Creswell, 2009). The purpose of mixed methods research is to combine qualitative and quantitative methods to offset the weaknesses of each approach with the strengths of the other. Thus, the validity and reliability of data obtained by both methods are increased (Creswell & Plano Clark, 2011). The descriptive sequence pattern, which is a mixed research model, was employed in this quantitative study. In descriptive sequence patterns, the researcher first collects and analyzes quantitative data, then collects and analyzes qualitative data to better explain the quantitative data (Creswell, 2009).

For the quantitative aspect of the study, "the Dyslexia Knowledge and Belief Scale" was used to identify the knowledge and beliefs of classroom teachers, who have students

with dyslexia in their classroom, and "the development of the Teachers' Beliefs About Literacy Questionnaire" to identify which approach they use to teach reading. For the qualitative aspect of the study, open-ended questions were asked to support quantitative data. These steps enabled the researchers to gain detailed information about the responses provided by teachers for both scales.

2.2.Study Group

The study group is made up of 400 classroom teachers working in Ankara in the school year of 2020-2021. The ages of teachers in the study group ranges from 28 to 60 (x=34.65). The characteristics of the teachers are shown in Table 1.

Table 1

Characteristics of Classroom Teachers

	N	%
Gender		
Female	322	80
Male	78	20
Educational levels of teachers		
Associate degree	9	2
Bachelor's degree	335	84
Master's degree	55	13
PhD degree	1	0.3
Years of experience		
1-10	42	10
11-20	174	43
21+	184	47

Table 1 shows that the majority of the teachers are women and have bachelor's degrees. Almost half of the teachers have experience of 21 years or more.

2.3. Data Collection Tools

2.3.1. Personal Information Form

To collect personal information, the researchers used "the Personal Information Form" developed by themselves. With this form, information was collected about the sex, age, and professional experience of teachers, whether they received training about reading difficulties and which reading models they were using while working with students with dyslexia.

2.3.2. The Scale of Knowledge and Beliefs about Dyslexia

The Scale of Knowledge and Beliefs about Dyslexia was developed by Soriano-Ferrer and Echegaray-Bengoa (2014) to identify the level of knowledge and beliefs of classroom teachers about dyslexia. The scale has a three-dimensional structure consisting of 36 items on general information, diagnosis, and treatment. The scale was adapted into Turkish by Dodur Sümer and Altındağ Kumaş (2021). The scale adopted a 3-point Likert scale using the options of correct (1), false (2) and do not know (3). As in its original form, the Turkish version of the scale also has 36 items and a three-factor structure. The internal consistency coefficients were .87, .85, and .78 for general information (17 items), diagnosis (10 items), and treatment (9 items), respectively.

2.3.4.Teachers' Beliefs About Literacy Questionnaire (TBALQ)

The development of the Teachers' Beliefs About Literacy Questionnaire (TBALQ) was developed by Knight and Westwood (1995) to identify the level of belief of teachers about how students acquire early literacy skills and how early readers should be taught literacy. Each response to items 1 to 24 in the questionnaire, from Strongly Disagree (SD) to Strongly Agree (SA), is given an appropriate score between 1 and 5. It must be noted that in some items, the scale operates from 1 to 5, and in other items from 5 to 1. Items 1, 2, 3, 9, 11, 13, 19, 22 should be scored with SD = 1 and SA = 5. Items, 4, 5, 6, 7, 8, 10, 12, 14, 15, 16, 17, 18, 20, 21, 23, and 24 should be scored DS = 5 and SA = 1."

The original scale's Cronbach Alfa value was 0.75. The original scale's test-retest reliability was .91. The items of the scale are about acquiring reading skills and top-down and bottom-up approaches. According to the scoring system of the scale, the higher the score of an individual, the greater the degree of identification with expressions that reflect a whole-language approach. If the score is lower, it means that the teacher adopts the direct teaching approach, which is completely guided by the teacher. A rating of 1 to 7 was used in the scale's final item. For this item, teachers were asked, "If you are supporting a teacher-centered and an over-structured teaching approach, please choose a score closer to 1. If you are supporting child-centered and random learning, please choose a score closer to 7" to get information about which reading approach teachers were using.

1.1.1. Open-Ended Research Questions

For the qualitative dimension of the study, the teachers were asked two questions about their knowledge about dyslexia and which reading models they used for students with learning difficulties. The first question was: "What does dyslexia mean to you?" And

the second question was: "With regard to students having difficulty reading and writing, which teaching approach you employ for teaching literacy and what kind of challenges do you experience?"

2.4. Data collection

The research was carried out online due to the COVID-19 pandemic. Items of all data collection tools were written into Google Forms and a sharable link was generated. The scales on Google Forms were made accessible for two weeks for data collection and then were closed for data entry. Since all items were made mandatory while designing the questionnaire on Google Forms, there were no missing data and therefore, no form was rendered invalid. Qualitative data was collected via video calls held with 40 teachers.

2.5. Data analysis

The SPSS 22.0 statistical software was used to analyze the data and measures of central tendency and distribution (frequency, percentage, average, kurtosis and skewness) were calculated for descriptive statistics and demographic variables. Prior to testing the beliefs and knowledge of classroom teachers about dyslexia and their beliefs on how literacy should be taught by various variables, the Kolmogorov-Smirnov normality test was performed to see whether the scores showed normal distribution. Due to the fact that the data set showed normal distribution, it was decided to perform parametric tests. Accordingly, the t and ANOVA tests were put to use. The cut-off points identified by Green and Salking (2005) were used to evaluate effect sizes. These cut-off points are regarded as small, medium, and large, and were 01, .06, and .14, respectively.

Qualitative data was analyzed by content analysis, which is a data analysis technique. The data obtained were numbered in same order of the interviews without making any changes, the teachers interviewed were assigned numbers, and each interview was transcribed without any corrections. To check reliability before data analysis, the recordings of 10 randomly selected interviews (25% of data) were heard by the researcher and an expert doctor on special education, and the transcriptions were verified. 100% reliability was achieved. Later, the transcribed data were transferred to the electronic interview form in the interviewer-interviewee order. On the left side of the interview form, the descriptive index, which summarizes the information in the data set and uses data-related abbreviations, was included while the right side included the remarks of the researcher with information and notes to assist data analysis. General remarks about the interview were included at the bottom of the page and the data set was formed. The researcher created themes for reducing existing data to perform the analysis of the obtained data using the induction method. Existing information was organized and divided into themes and assigned codes. For thematization, the data in the coding file were read by the researcher, and the data that can be collected under the same title were assigned a title, and excerpts from teacher interviews were included under appropriate titles. The titles formed the themes of the study while sub-titles formed the sub-themes.

Themes created by the researcher were handed over to two lecturers working in the field of special education along with the coding files, and these lecturers created themes and sub-themes for two randomly selected coding files.

3. Results

Table 2. Kolmogorov Smirnov Test for Dyslexia knowledge and Belief Scale and TBALQ Factors

Kolmogorov-Smirnov(a)			
	Statistic	df	Sig.
General Information	.151	400	.000
Diagnosis	.139	400	.000
Treatment	.156	400	.000
TBALQ	.135	400	.000

Table 2 shows that the assumption of normality is not met due to the fact that p values are smaller than 0.05. Below are the kurtosis and skewness coefficients for the data set (Table 3).

Table 3. Coefficients of skewness and kurtosis.

		Statistic	Std. Error
General Informantion	Skewness	.75	.16
	Kurtosis	.03	.33
Diagnosis	Skewness	.78	.16
	Kurtosis	-.59	.36
Treatment	Skewness	.73	.17
	Kurtosis	-.41	.35
TBALQ	Skewness	.81	.12
	Kurtosis	.16	.24

In social sciences, it is recommended to check coefficients of kurtosis and skewness of data sets rather than normality (Field. 2009). The coefficients of skewness and kurtosis in Table 3 show that the calculated values of all factors are within the range of -1 and +1. As Table 3 shows that data show normal distribution, it was considered appropriate to use parametric tests.

Percentage and frequency of the responses of classroom teachers to the Scale of Knowledge and Beliefs about Dyslexia and the number of “correct", "false", and "do not know" responses for each item and the average scores of teachers in the TBALQ score are provided in Table 4.

Table 4. Descriptive Statistics on the Scale of Knowledge and Beliefs about Dyslexia and TBALQ

Dyslexia Scale:		Knowledge and Belief Items	Correct N	Correct %	TBALQ Rating Average $\bar{x}$	False N	False %	TBALQ Rating Average $\bar{x}$	Do Not Know N	Do Not Know %	TBALQ Rating Average $\bar{x}$	Correct Answer
General Information	1	Dyslexia is the result of a neurologically-based disorder.	229	58	2.6	49	12	2.5	122	30	2.7	True
	2	Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.	348	88	2.6	19	4	2.7	33	8	2.7	False
	3	A child can be both dyslexic and gifted.	342	86	2.6	12	3	2.7	46	11	2.7	True
	4	Dyslexic children often have emotional and social disabilities.	226	57	2.7	85	21	3.1	89	22	2.6	True
	5	The brains of individuals with dyslexia are different from those of people without dyslexia.	171	43	2.7	108	27	2.5	121	30	2.7	True
	6	Dyslexia is hereditary.	67	17	2.4	174	44	2.7	159	39	2.7	True
	7	Most studies indicate that about 5% of school-age students have dyslexia	166	41	2.6	19	4	2.9	215	55	2.6	True
	8	Dyslexia has a greater occurrence in males than in females	82	20	3	46	11	2.6	271	68	2.6	True
	16	All poor readers have dyslexia.	5	1	2.6	365	92	2.8	30	7	2.4	False
	20	Students who have reading disabilities without an apparent cause are called dyslexic	77	19	3	253	63	2.7	70	18	2.4	True
	21	People with dyslexia are not stupid or lazy. Knowing about the term helps children	383	96	2.7	0	2	2.6	17	4	2.4	True
	25	I think dyslexia is a myth, a problem that does not exist.	2	1	2.7	378	95	2.6	20	4	2.6	False
	27	Problems in establishing laterality (body schema) are the cause of dyslexia.	123	31	2.7	42	11	2.5	235	58	2.7	True
	29	Dyslexia refers to a	52	13	2.9	229	57	2.8	119	30	2.5	True

		relatively chronic condition that is often not completely overcome.										
	30	Many students with dyslexia continue to have reading problems as adults.	85	22	2.5	167	41	2.6	148	37	2.7	True
	31	Many students with dyslexia have low self - esteem.	212	53	2.7	114	28	2.7	74	19	2.6	True
	35	Dyslexia usually lasts for a long time.	198	49	2.7	37	9	3.2	165	42	2.6	True
Diagnosis	9	Children with dyslexia are more consistently impaired in phonemic awareness (i.e ability to hear and manipulate sounds in language) than any other ability	246	61	2.8	15	4	1.7	139	35	2.6	True
	11	People with dyslexia have below average Intelligence	13	3	2.4	340	85	2.7	47	12	2.6	False
	12	The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.	313	78	2.8	42	10	2.6	45	12	2.5	True
	13	Seeing letters and words backwards is a basic characteristic of dyslexia.	347	86	2.8	10	2	3.5	43	12	2.2	False
	14	Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.	243	61	2.7	23	6	2.6	134	33	2.6	True
	15	Intelligence tests are useful in identifying dyslexia	53	13	2.2	198	49	2.7	149	38	2.2	True
	32	Children with dyslexia have problems with decoding and spelling but not with listening comprehension.	268	67	2.8	41	10	2.3	91	23	2.4	True
	33	Applying an individual reading test is essential to diagnosing dyslexia.	214	53	2.6	51	13	2.3	135	34	2.7	True
	34	Dyslexics tend to spell words wrong.	266	66	2.6	31	8	2.5	103	26	2.6	True
	36	Dyslexia is characterized by difficulty with learning to read fluently.	231	58	2.8	70	17	3.7	99	25	2.5	True
Treatment	10	Modeling fluent reading is often used as a teaching strategy.	226	56	2.4	40	10	2.9	134	34	2.8	True
	17	Children with dyslexia can be helped by using	273	68	2.9	9	2	2.1	118	30	2.2	False

	colored lenses/colored overlays.										
18	Physicians can prescribe medications to help students with dyslexia.	38	10	2.7	198	49	2.7	164	41	2.6	False
19	Multisensory instruction is not an effective training method now.	60	15	2.9	167	42	2.7	173	43	2.6	False
22	Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students	26	6	2.6	331	83	2.7	43	11	2.6	False
23	Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia	306	76	2.6	5	1	2.6	89	23	2.7	True
24	Most teachers receive intensive training in working with dyslexic children	151	38	2.7	112	28	3	137	34	2.5	False
26	Repeated reading techniques are useful reading material to improve reading fluency	342	85	2.7	13	3	2.1	45	12	2.6	True
28	Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies	255	64	2.9	14	3	2.1	131	33	2.5	True

Table 4 shows that classroom teachers have many misconceptions about dyslexia. In the general information factors, 88% of the teachers mistakenly considered the item "Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words" to be correct. Even though the item "Dyslexia refers to a relatively chronic condition that is often not completely overcome" is correct, 57% of the teachers stated it to be false. 68% of the teachers answered "do not know" to the item "Dyslexia has a greater occurrence in males than in females." In the diagnosis factor, 88% of the teachers answered the item "Seeing letters and words backwards is a basic characteristic of dyslexia", correctly, which is false. In the treatment factor, 68% of the teachers answered the item "Children with dyslexia can be helped by using colored lenses/colored overlays", correctly, which is false. The average scores of teachers on the TBALQ scale was also measured based on their answer (correct, false, or do not know) to each item. According to Table 4, the teachers' scores range from 3.7 to 2.1, which shows that regardless of whether they are knowledgeable about dyslexia or not, teachers opt for a structured top-

down reading approach.

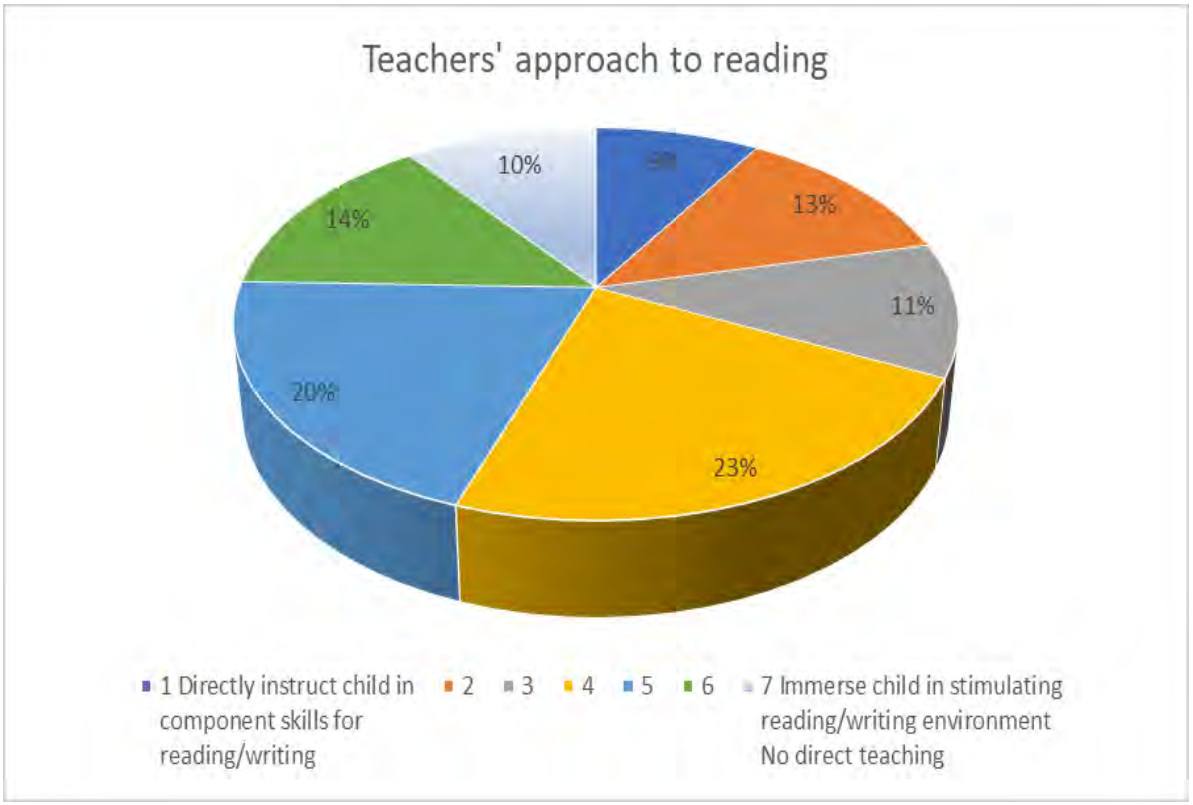

Figure 1. Continuum Ratings for Top-Down and Bottom- Up Structure

In the last item of the TBALQ scale, teachers rated which reading approach they used from 1 to 7. For this item, teachers rated closer to 1 are those using the teacher-centered/bottom-up reading approach while teachers rated closer to 7 are those using the child-centered/top-down reading approach. Figure 1 shows that teachers use the teacher-centered approach less and the child-centered bottom-up more.

Table 5. Descriptive statistics of the scores teachers received in TBALQ

		1 Strongly Disagree	2	3	4	5 Strongly Agree	Mean
		%	%	%	%	%	
1.	Children learn to read in the same natural way that they acquire oral and aural language skills.	20	29	22	19	9	2.67
2.	Devoting specific time to word study in isolation is undesirable since this practice decontextualises a component skill of language.	23	28	26	19	4	2.54
3.	Teachers should select books for children to read based on the difficulty level of the text.	43	26	8	9	13	2.22
4.	Learning to read should involve attending closely to the print on the page.	22	32	23	12	11	2.56
5.	Flashcard drill should be used to build up children's sight vocabularies.	32	31	14	11	12	2.38
6.	Beginning readers should be taught phonic skills.	35	33	9	11	12	2.32
7.	Graded reading schemes using controlled vocabulary should be used in classrooms.	36	31	10	11	12	2.34
8.	Sight vocabulary learnt in isolation does transfer to text reading.	14	34	29	15	8	2.67
9.	For effective learning, literacy programs should be organised to allow for the specific study of separate skills such as comprehension, word recognition and phonics.	32	33	14	13	8	2.33
10.	Children learn to spell in the same natural way that they acquire oral language skills.	16	33	25	19	7	2.67
11.	Teachers should choose the words children need to learn to spell.	25	37	14	16	8	2.47
12.	Teachers should regularly test spelling.	23	39	15	14	9	2.49
13.	The use of spelling lists is essential for learning how to spell.	21	37	16	16	10	2.55
14.	Children's use of invented spelling reinforces bad habits.	20	31	21	16	12	2.68
15.	Words learnt in spelling lists are generally transferred successful to children's writing.	21	40	14	15	10	2.49
16.	Spelling involves careful listening to sounds within words.	21	43	16	12	8	2.55
17.	Young children's phonemic awareness skills predict their ability to learn to spell in the early years.	13	40	26	15	6	2.68
18.	Learning to spell depends almost entirely upon vision (e.g. look-cover-write- check), rather than attending to the sounds within words.	18	41	19	15	7	2.51
19.	Specific time each week should be devoted to the explicit teaching of spelling.	18	33	26	16	7	2.40
20.	There is an important place for direct instruction in spelling in the early school years.	16	29	27	19	9	2.61

Table 5 shows that to all items of the TBALQ scale, teachers responded either "completely disagree" or "disagree." Likewise, the average scores for all items range from 2.22 to 2.68. Low scores on this scale also indicate that teachers adopt a more structured

and bottom-up model approach.

Table 6. Independent t Test Results by the Gender Variable

	Gender	N	$\overline{x}$	Ss	t	p	Effect size
General Information	Female	322	1.92	.33	-3.46	.73	.00
	Male	78	1.93	.36			
Diagnosis	Female	322	1.68	.43	-1.18	.23	.00
	Male	78	1.75	.45			
Treatment	Female	322	1.82	.38	-1.24	.21	.00
	Male	78	1.88	.41			
TBALQ	Female	322	2.59	.74	-2.45	.01	.01
	Male	78	2.83	.86			

According to Table 6, the Scale of Knowledge and Beliefs about Dyslexia did not show any significant difference in terms of gender in any of the three factors. Even though the TBALQ scale showed significant differences in terms of gender, their effect size is small ($\eta 2$=.01).

Table 7. ANOVA Test Results by Year of Experience

Factors	Year of experience	N	$\overline{x}$	ss	F	p	Effect Size
General knowledge	1-10	42	1.87	.34	.32	.81	.00
	11-20	174	1.92	.32			
	21+	184	1.92	.35			
Diagnosis	1-10	42	1.58	.41	2.25	.08	.00
	11-20	174	1.67	.40			
	21+	184	1.74	.47			
Treatment	1-10	42	1.77	.40	.79	.50	.00
	11-20	174	1.82	.38			
	21+	184	1.86	.40			
TBALQ	1-10	42	2.73	.73	.32	.80	.00
	11-20	174	2.65	.72			
	21+	184	2.61	.82			

According to Table 7, teachers' knowledge and beliefs about dyslexia and their beliefs about teaching literacy does not differ significantly in terms of the year of experience

variable.

Figure 2. Teachers' training on dyslexia

According to Figure 2, only 5% of the teachers stated receiving training on reading difficulties. All those who did receive training stated that it was insufficient.

Table 8. Demographics of teachers, on which qualitative data were collected

	N	%
Gender		
Female	32	80
Male	8	20
Years of teaching experience		
1-10	8	20
11-20	10	25
21+	22	55

According to Table 8, 80% of the teachers who participated in qualitative data studies were women and 20% were men. The majority of the teachers had an experience of 21 years or more

Teachers were first asked, "What does dyslexia mean to you?" The obtained findings are summarized in Table 9.

Table 9. Teachers' Views on Dyslexia

Sub-Themes	Quotation	Teacher Code	N
A learning disorder	It is a learning disorder. Dyslexia is not a learning disorder. It is a learning disorder that can be overcome by various learning methods.	T2, T4	2
Slow and inaccurate reading	Perceiving what is read wrong due to slow and inaccurate reading	T6	1
A reading problem	An individual who has trouble reading.	T13, T15	2
Writing letters and reading words backwards	I think it is reading letters backwards; perceiving b as d I think it is writing letters backwards. As far as I know, it is reading words backwards	T7, T8, T9, T11, T12, T14, T17, T18, T24, T25, T26, T28, T31, T34, T36, T37, T40	17
Reading difficulty	I think about reading difficulty. Difficulty reading.	T1, T3, T5, T10, T16	5
Learning difficulty	Learning difficulty Learning difficulty that develops at a young age	T19, T20, T23, T32	4
Disease	It's a treatable disease. It requires patience and expertise. A short-term disease that causes problems in learning literacy.	T21, T22	2
Difficulty reading and writing	Difficulty reading and writing Difficulties in reading and writing.	T33, T35	2
Developmental disorder	A non-genetic temporary disorder It is not a problem of intelligence but of language Difficulty speaking, which also causes problems in reading.	T38	1
A neurological disorder	It is a neurological condition Left and right lobes of the brain work simultaneously Vaccines that disrupt our genes, genetically modified food and neurological disorder I would describe it as an innate neurological difference.	T39	1
A curable syndrome	A curable problem A curable disorder A curable problem	T10, T15	2
A mental and physical problem	İt is a mental and physical problem	T21	1

Table 9 shows that, similar to the Scale of Knowledge and Beliefs about Dyslexia, teachers defined dyslexia as "reversing letters and words."

Secondly, teachers were asked given students with difficulty in reading and writing, "What kind of difficulties do you face when teaching reading and writing and which reading approach do you employ?" The obtained findings are summarized in Table 10.

Table 10. Difficulties faced by teachers in teaching literacy

Sub-Themes	Quotation	Teacher Code	N
Method and technique	They have difficulty in determining the direction of some letters such as b and d and figures. I would like to know more about coping methods. I do not employ a different reading approach for such children; I am using the phonic-based reading model. I would like to get support for different teaching methods. For such children, I am making use of the phonic-based teaching approach.	T2, T4, T6, T13, T15, T7, T8, T9, T11, T12, T14, T17, T18, T24, T25, T26, T28, T31, T34, T36, T37, T40	22
Special education	I am using the phonic-based method that I always use. That is why I would like to get support on special education. I do not know what to do about this. I would like to be trained about children with speech impediment or attention deficit. I think that it is more effective to teach reading to such children using the sentence method. I would like to get support about teaching literacy to students with special needs. I am using the phonics-based approach.	T1, T3, T5, T10, T16, T19, T20, T23, T32, T21, T22, T33, T35 T38, T39, T10, T15, T21	18

Table 10 shows teachers saying that they need support in teaching literacy to students with dyslexia and they do not know how to help such children. They also stated that they do not use a different literacy teaching method for such children. Only one teacher mentioned teaching literacy using a sentence-based model for students with dyslexia.

4. Discussion

This study examines the beliefs and knowledge of classroom teachers that have students with dyslexia. Both qualitative and quantitative data show that teachers consider dyslexia to be associated with a lack of visual perception and that seeing letters and words backwards is the most prominent characteristic of dyslexia. Other results pointing to the lack of knowledge of teachers about dyslexia show that more than half of the participants believe that colored lenses/colored overlays are an effective method for helping children with dyslexia and are unaware of the fact that dyslexia is genetic.

The study shows that teachers define dyslexia using behavioral descriptors. These results are parallel with the results of other studies that examine the knowledge of teachers about dyslexia (Allington, 1982; Sümer Dodur & Altındağ Kumaş, 2020; Wellington & Wadlington, 2005; Washburn Joshi & Binks-Cantrell 2011; Washburn et al, 2014). However, as Frith (1995) points out, understanding the biological and cognitive aspects of dyslexia is important for having a good grasp of it. The results of this study and the previous ones show that biological and cognitive factors are not commonly mentioned by teachers.

The data also reveals that many of the teachers are aware that children with dyslexia have difficulty decoding and spelling, phonological processing of information is one of the most important deficits in dyslexia, and children with dyslexia have problems in fluent reading and tend to misspell. These results show similarity with the findings of the studies by Wadlington and Wadlington (2005) and Washburn et al. (2011). These findings suggest that teachers, who focus on teaching literacy in the early years of elementary school, are aware of the effects of dyslexia on reading despite having misconceptions about it.

Many students with dyslexia (diagnosed or not) do not receive the education they need that is based on evidence (Lyon & Weiser, 2009; Mills & Clarke, 2017; Moats, 2004). The lack of proper education for students with dyslexia is a result of the lack of proper training for teachers or mis implementation of interventions. Research shows that most teachers receive very little formal training during their undergraduate studies on reading development and disorders (Lyon & Weiser, 2009). In this study, only 5% of the teachers stated that they received training on reading disorders. All those who did receive training stated that it was insufficient. Similarly, qualitative data shows that teachers need support for teaching literacy to students with reading difficulties and they do not know how to support them. In this case, teachers, without getting any training on this topic, keep on using the same non-evidence-based intervention for a long time (Mills, & Clarke, 2017). And this leads to students' difficulties to worsen (Shaywitz et al, 2007). Research reports that when ineffective interventions or pedagogical methods are used, the gap between a student's reading skills and the overall classroom level widens, and a

more intensive intervention is required (Bacon & Handley, 2014; Bogon, Finke, Schulte-Korne, Muller, Schneider & Stenneken, 2014; Zoubrinetzky, Collet, Serniclaes, Nguyen-Morel & Valdois, 2016).

In this study, using the TBALQ scale, it was attempted to identify which reading approach teachers with students with dyslexia students employ in their classroom. It was found that, whether they were knowledgeable about dyslexia or not, teachers adopt the teacher-centered bottom-up reading approach. In the last item of the TBALQ scale, teachers were asked to rate which reading approach they used. Here, in contrast to the result of the other scale, teachers noted using the child-centered top-down reading approach. Such a result can be explained by the fact that teachers focus on teaching skills in the early years of reading teaching, but later, they believe that literacy teaching should take place with interesting activities in a rich atmosphere. The fact that teachers opt for the bottom-up reading approach in the early years can be associated with the national policies on teaching reading. As a matter of fact, qualitative data show that teachers used the nation-wide phonics-based reading method for all of their students, including those with dyslexia.

Although there is no difference between the difficulty's children with dyslexia experience in different languages, the relationships between grapheme and phoneme affect reading acquisition. This results in differences in the reading development of children speaking different languages (Ziegler & Goswami 2005). It is reported that phonemic and syllable awareness, which are the first steps of literacy acquisition, are acquired earlier in languages with transparent orthography such as Turkish (Durgunoğlu & Öney, 1999). That is why dyslexia can be noticed in readers later in school, even after the fourth grade (Ziegler & Goswami 2005). In Turkey, studies on dyslexia are very new. For this reason, it is not known which interventions and reading strategies are effective for Turkish-speaking children. The only study that investigated this topic concluded that compared to the phonics-based sentence method, the sentence decoding method is more effective in reading and writing letters, syllables, words, and sentences in students with dyslexia (Karamuklu, 2018). Teachers are left to their own devices on this matter due to the lack of studies and undergraduate and in-service training. That is why teachers use the bottom-up reading approach, which is the nation-wide reading policy, to teach literacy also to children with dyslexia and shape their interventions accordingly.

According to Lyon (1997), many teachers are stuck not knowing how to teach reading and how to help students with reading difficulties. It is reported that directing teachers to a specific reading approach for teaching reading can put students under constant risk of reading failures (Lyon, 1997). It is noted that what is important in teaching reading is to identify which students require which reading approach for how long and in what type of environment (Fletcher et al, 2007; McCardle & Chhabra, 2004; Rayner, Foorman,

Perfetti, Pesetsky & Seidenberg, 2001). Therefore, it is not right to impose reading approaches, which are the country policy, on teachers. Even if they are using a structured program, teachers should be able to recognize the needs of all children in terms of reading continuum and language proficiency (Moats & Foorman, 2003). It is especially imporant to identify which reading component students with reading difficulty have problems with and which reading approaches are effective for them. Given the fact that teachers need better preparation, professional development, and resources to teach reading, spelling, and writing skills, it is recommended that they be supported both in undergraduate training and during their professional lives.

This study revealed that teachers lack sufficient knowledge about dyslexia and want to receive training on this topic. There was also no difference between the teachers' sex and experience and their knowledge about dyslexia. In other words, even teachers who have more experience with students with dyslexia lack sufficient knowledge about dyslexia. This clearly shows the lack of training on this topic. Therefore, it is recommended that during undergraduate and in-service training, teachers are informed about what dyslexia is and which interventions and strategies are effective for it.

Although this study was conducted with a large sample group, this group was made up of only teachers working in public schools in a single province. It is recommended that future studies also include teachers working in private schools and other geographical regions. It is also important to examine the relationship between the reading performance of students with dyslexia and the beliefs of and reading methods used by educators to identify which approaches are effective and to show the importance of the knowledge of teachers for practice.

5. Conclusion

As a result, this study revealed that teachers have numerous misconceptions about dyslexia, and they employ the same reading approach for each and every student. However, most educators want to learn more about this issue and help students with dyslexia. That is why policymakers and universities should lend an ear to teachers to offer them theoretical and practical training, information, and practical experience. In Turkey, there has been an increasing interest in dyslexia in research. It is particularly important to identify which reading approaches, interventions and strategies are effective by doing more research on the relationship between Turkish and dyslexia. In light of all this, it is important to organize meetings, workshops, and case studies to discuss evidence-based practices targeting children with dyslexia and to share this information with teachers. This way, children with dyslexia can be recognized in classrooms early on and the adverse effects of dyslexia can be alleviated thanks to effective interventions.

References

Allington, R. L. (1982). The persistence of teacher beliefs in facets of the visual perceptual deficit hypothesis. *The Elementary School Journal*, *82*(4), 351-359.

Bacon, A. M., & Handley, S. J. (2014). Reasoning and dyslexia: is visual memory a compensatory resource?. *Dyslexia*, *20*(4), 330-345. https://doi.org/10.1002/dys.1483

Bogon, J., Finke, K., Schulte-Körne, G., Müller, H. J., Schneider, W. X., & Stenneken, P. (2014). Parameter-based assessment of disturbed and intact components of visual attention in children with developmental dyslexia. *Developmental Science*, *17*(5), 697-713. https://doi.org/10.1111/desc.12150

Balcı, E. (2015). *The evaluation of education programs used for individuals with dyslexia in USA in terms of its contribution to the studies in Turkey* [Doctoral dissertation]. Gazi University, Institute of Educational Sciences, Ankara.https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Balcı, E. (2019). Teachers' opinions about dyslexia and the challenges they face. *Journal of Ege Education*, *20*(1), 162-179. http://doi:10.12984/egeefd.453922

Beckman, T. O., Messersmith, K., Shepard, J., & Cates, B. (2012). Ethnicity, language and poverty predicting scores on the Nebraska state accountability reading test. *International Journal of Psycho*

Bos, C., Mather, N., Dickson, S., Podhajski, B., & Chard, D. (2001). Perceptions and knowledge of preservice and inservice educators about early reading instruction. *Annals of Dyslexia*, *51*(1), 97-120.*logy: A Biopsychosocial Approach*, *11*(1), 31-47**.**

Caravolas, M., Lervåg, A., Mousikou, P., Efrim, C., Litavský, M., Onochie-Quintanilla, E., ... & Seidlová-Málková, G. (2012). Common patterns of prediction of literacy development in different alphabetic orthographies. *Psychological science*, *23*(6), 678-686.

Creswell, J. W. (2009). Mapping the field of mixed methods research. *Journal of Mixed Methods Research, 3(*2), 95-108. doi:10.1177/1558689808330883.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research (2nd ed.).* Thousand Oaks, CA: Sage

Currie, P., & Wadlington, E. (2000). The source for learning disabilities. East Moline, IL: Linguisystemsbetic orthographies. *Psychological science*, *23*(6), 678-686.

Demirel, M. (2006). A *research on changes in teaching litecary*. [Unpublished master dissertation]. Selçuk Üniversitesi Sosyal Bilimler Enstitüsü, Konya.

Doğan, B. (2013). Determining Turkish language and elementary classroom teachers' knowledge on dyslexia and their awareness of diagnosing students with dyslexia. *Research in Reading & Writing Instruction*, *1*(1), 20-33.

Durgunoğlu, A. Y., & Öney, B. (1999). A cross-linguistic comparison of phonological awareness and word recognition. *Reading and Writing*, *11*(4), 281-299.

Durukan, E. ve Alver, M. (2008). Ses temelli cümle yönteminin öğretmen görüşlerine göre değerlendirilmesi [Teachers' views on cursive letters fonts]. *Uluslararası Sosyal Araştırmalar Dergisi, 1* (5), 274-289.

Erkul, Ö., & Erdoğan, T. (2009). The problems and suggestions encountered during the implementation of the sound based sentence method. *Procedia-Social and Behavioral Sciences*, *1*(1), 2294-2300.

ERG (2019). *Eğitimin yönetişimi ve finansmanı [Education management and financing].* https://www.egitimreformugirisimi.org/wp-content/uploads/2010/01/EIR_E%C4%9Fitimin_Y%C3%B6netisimi_ve_Finansman%C4%B1.pdf .

Ferah, A.(1999). Investigation of the relationships between visual perception and ıntelligence and reading-writing in the first reading-writing period. *4. Ulusal Eğitim Bilimleri Kongresi*, 327-341

Foorman, B. R., Breier, J. I., & Fletcher, J. M. (2003). Interventions aimed at improving reading success: An evidence-based approach. *Developmental neuropsychology*, *24*(2-3), 613-639. https://doi.org/10.1080/87565641.2003.9651913.

Gooch, D., Snowling, M., & Hulme, C. (2011). Time perception, phonological skills and executive function in children with dyslexia and/or ADHD symptoms. *Journal of child psychology and psychiatry*, *52*(2), 195-203. https://doi.org/10.1111/j.1469-7610.2010.02312.x

Goodman, K. S. (1967). Reading: A psycholinguistic guessing game. *Literacy Research and Instruction*, *6*(4), 126-135. https://doi.org/10.1080/19388076709556976

Gunning, T. G. (2008). *Developing higher-level literacy in all students: Building reading, reasoning, and responding.* Boston: Allyn & Bacon. http://dx.doi.org/10.5539/elt.v9n10p14

Guthrie, J. T. (2002). Preparing students for high-stakes test taking in reading. *What research has to say about reading instruction*, *3*, 370-391. https://doi.org/10.1598/0872071774.16

Gün, A. (2006). *Öğretmenlerin ses temelli cümle yöntemine ilişkin algıları ve görüşleri* [*Teachers' perceptions and opinions about phonetic based method]*. [Unpublished master dissertation]. Dokuz Eylül Üniversitesi, İzmir.

Guzel-Ozmen, R., & Dogan, Y. (2009, July). *İlk okuma yazmayi farklı yontemlerle ogrenen ogrencilerin okudugunu anlama, okuma hizi ve okuma hatalari bakımından karsilastirilmasi [Comparison to reading comprehension, oral reading rate and reading mistake of elementary students in terms of acquisition reading different literacy instruction method].* Paper presented at the meeting of the Second International Turkish Teaching and Education Congress, Urgup, Turkey.

Green, S., & Salkind, N. (2005). Using SPSS for Windows and Macintosh: Understanding and Analysing Data. Upper Saddle River, NJ: Prentice Hall.

Fletcher, J.M., Lyon, G.R., Fuchs, L.S., & Barnes, M.A. (2007). *Learning disabilities: From identification to intervention*. New York: Guilford.

Field, A. (2009). *Discovering statistics using SPSS*. London: Sage

Frith, U. (1995). Dyslexia: Can we have a shared theoretical framework. *Educational and Child Psychology,* 12, 6–17

Hatcher, P. J., Hulme, C., & Snowling, M. J. (2004). Explicit phoneme training combined with phonic reading instruction helps young children at risk of reading failure. *Journal of child Psychology and Psychiatry*, *45*(2), 338-358. https://doi.org/10.1111/j.1469-7610.2004.00225.x

Helland, T., Tjus, T., Hovden, M., Ofte, S., & Heimann, M. (2011). Effects of bottom-up and top-down intervention principles in emergent literacy in children at risk of developmental dyslexia: A longitudinal study. *Journal of Learning Disabilities*, *44*(2), 105-122. https://doi.org/10.1177/0022219410391188

International Dyslexia Association. (2003). *ABCs of dyslexia*. [Online]. Available: http//www.interdys.org. (Retrieyed February 26, 2019).

Karamuklu, E. S. (2018). *Disleksi olan öğrencilerde cümle çözümleme ve ses temelli cümle yöntemleri ile okuma yazma öğretiminin etkililiğinin karşılaştırılması [Comparison of the effectiveness of literacy instruction with sentence analysis and sound-based sentence methods in students with dyslexia]* [Unpublished master dissertation]. Necmettin Erbakan Üniversitesi Eğitim Bilimler Enstitüsü, Konya.

Lovino, I., Fletcher, J. M., Breitmeyer, B. G., & Foorman, B. R. (1998). Colored overlays for visual perceptual deficits in children with reading disability and attention deficit/hyperactivity disorder: are they differentially effective? *Journal of Clinical and Experimental Neuropsychology*, *20*(6), 791-806. https://doi.org/10.1076/jcen.20.6.791.1113

Lyon, G. R. (1996). The state of research. In S.Cramer & W. Ellis (eds.), *Learning disabilities: Lifelong*

Lyon, G., & Weiser, B. (2009). Teacher knowledge, instructional expertise, and the development of reading proficiency. *Journal of learning disabilities*, *42*(5), 475-480. https://doi.org/10.1177/0022219409338741

Norton, E. S., Beach, S. D., & Gabrieli, J. D. (2015). Neurobiology of dyslexia. *Current opinion in neurobiology*, *30*, 73-78. https://doi.org/10.1016/j.conb.2014.09.007

McCardle, P., & Chhabra, V. (Eds.). (2004). *The voice of evidence in reading research*. Baltimore: Paul H. Brookes

Melekoğlu, M. A., & Sak, U. (2018). *Öğrenme güçlüğü ve özel yetenek* [*Learning difficulties and special ability]*. Ankara: Pegem Akademi Yayıncılık.

Mills, J. R., & Clarke, M. (2017). Dyslexia and the Need for Teacher Training: A Collaborative Three-Pronged Approach between a University and a Community Partner. *Leadership and Research in Education*, *4*(1), 77-89.

Moats, L. C. (2004). Efficacy of a structured, systematic language curriculum for adolescent poor readers. *Reading & Writing Quarterly*, *20*(2), 145-159. https://doi.org/10.1080/10573560490262082

Moats, L. C., & Foorman, B. R. (2003). Measuring teachers' content knowledge of language and reading. Annals of Dyslexia, 53, 23–45.

Morais, J., & Kolinsky, R. (2005). Literacy and cognitive change. In M. Snowling & C. Hulme (Eds.), The science of reading: A handbook (pp. 188–203). Oxford: Blackwell.

Onan, B. (2009). The cognitive backgrounds that agglutinating language structure form in Turkish teaching. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *6*(11), 236-263.

Öney, B., & Durgunoğlu, A. Y. (1997). Beginning to read in Turkish: A phonologically transparent orthography. *Applied psycholinguistics*, *18*(1), 1-15. https://doi.org/10.1017/S014271640000984X

Öney, B., & Goldman, S. R. (1984). Decoding and comprehension skills in Turkish and English: Effects of the regularity of grapheme-phoneme correspondences. *Journal of Educational Psychology, 76*(4), 557–568. https://doi.org/10.1037/0022-0663.76.4.557

Özsoy, U. (2006). *Ses temelli cümle yöntemiyle okuma yazma öğretiminde karşılaşılan güçlükler* [*The difficulties wich are faced while teaching of reading and writing with phonic basis sentence method]* [Unpublished doctoral dissertation]. Osmangazi Üniversitesi Sosyal Bilimler Enstitüsü, Eskişehir.

Paulesu, E., Démonet, J. F., Fazio, F., McCrory, E., Chanoine, V., Brunswick, N., ... & Frith, U. (2001). Dyslexia: cultural diversity and biological unity. *Science*, *291*(5511), 2165-2167. https://doi.org/10.1126/science.1057179

Peterson, R. L., & Pennington, B. F. (2015). Developmental dyslexia. *Annual review of clinical psychology*, *11*, 283-307. https://doi.org/10.1146/annurev-clinpsy-032814-112842

Rayner, K., Foorman, B. R., Perfetti, C. A., Pesetsky, D., & Seidenberg, M. S. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest, 2*, 31–74.

Seidenberg, M. S. (2013). The science of reading and its educational implications. *Language Learning and Development*, *9*(4), 331-360. https://doi.org/10.1080/15475441.2013.812017

Shaywitz, S. (2003). *Overcoming dyslexia*. First Vintage Books Edition, New York.

Shaywitz, S. E., Gruen, J. R., & Shaywitz, B. A. (2007). Management of dyslexia, its rationale, and underlying neurobiology. *Pediatric Clinics of North America*, *54*(3), 609-623. https://doi.org/10.1016/j.pcl.2007.02.013

Snowling, M. J. (2000). *Dyslexia*. Oxford: Blackwell publishing.

Snowling, M. J., Nash, H. M., Gooch, D. C., Hayiou-Thomas, M. E., Hulme, C., & Wellcome Language and Reading Project Team. (2019). Developmental outcomes for children at high risk of dyslexia and children with developmental language disorder. *Child Development*, *90*(5), https://doi.org/10.1111/cdev.13216

Soriano, M., & Miranda, A. (2010). Developmental dyslexia in a transparent orthography: A study of Spanish dyslexic children. In T. E. Scruggs & M. A. Mastropieri (Eds.), Literacy and learning. Advances in learning and behavioral disabilities (pp. 95–114). Amsterdam (The Netherlands): Emerald Group Publishing Limited. doi:10.1108/S0735-004X(2010)0000023006

Soriano-Ferrer, M., & Echegaray-Bengoa, J. A. (2014). A scale of knowledge and beliefs about developmental dyslexia: Scale development and validation. *Procedia-Social and Behavioral Sciences*, *132*, 203-208. https://doi.org/10.1016/j.sbspro.2014.04.299

Stanovich, K. E. (1980). Toward an interactive-compensatory model of individual differences in the development of reading fluency. *Reading research quarterly*, 32-71. https://doi.org/10.2307/747348

Sümer Dodur, H. M., & Altindağ Kumaş, Ö. (2020). Knowledge and beliefs of classroom teachers about dyslexia: The case of teachers in Turkey. *European Journal of Special Needs Education*, 1-17. https://doi.org/10.1080/08856257.2020.1779980

Şahin, I., Inci, S., Turan, H., & Apak, O. (2006). Ilk okuma ogretiminde ses temelli cumle yontemiyle cozumleme yonteminin karsilastirilmasi [Comparison of the phonics and the whole language methods on reading instruction]. *Milli Egitim Dergisi*, *171*, 109-129.

Verhoeven, L., & Perfetti, C. (2008). Advances in text comprehension: Model, process and development. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition*, *22*(3), 293-301. https://doi.org/10.1002/acp.1417

Wadlington, E. M., & Wadlington, P. L. (2005). What educators really believe about dyslexia. *Reading Improvement, 42*(1), 16-33.

Washburn, E. K., Joshi, R. M., & Binks-Cantrell, E. S. (2011). Teacher knowledge of basic language concepts and dyslexia. *Dyslexia*, *17*(2), 165-183.

Washburn, E. K., Binks-Cantrell, E. S., & Joshi, R. M. (2014). What do preservice teachers from the USA and the UK know about dyslexia? *Dyslexia*, *20*(1), 1 18. https://doi.org/10.1002/dys.1459

Wajuihian, S. O. (2012). Neurobiology of developmental dyslexia part 1: A Review of evidence from autopsy and structural neuro-imaging studies. *Optometry & Vision Development*, *43*(3). https://doi.org 10.4102/AVEH.V70I4.117

Westood, P. (1996). Influencing teachers' beliefs about children's acquisition of literacy. *Australian Journal of Learning Difficulties*, *1*(2), 14-17. https://doi.org/10.1080/19404159609546505

Westwood, P., Knight, B. A., & Redden, E. (1997). Assessing teachers' beliefs about literacy acquisition: The development of the teachers' beliefs about literacy questionnaire (TBALQ). *Journal of Research in Reading*, *20*(3), 224-235.

Williams, J. A., & Lynch, S. A. (2010). Dyslexia: What teachers need to know. *Kappa Delta Pi Record*, *46*(2), 66-70. https://doi.org/10.1080/00228958.2010.10516696

Ziegler, J. C., & Goswami, U. (2005). Reading acquisition, developmental dyslexia, and skilled reading across languages: a psycholinguistic grain size theory. *Psychological bulletin*, *131*(1), 3.

Zoubrinetzky, R., Collet, G., Serniclaes, W., Nguyen-Morel, M. A., & Valdois, S. (2016). Relationships between categorical perception of phonemes, phoneme awareness, and visual attention span in developmental dyslexia. *PloS one*, *11*(3), e0151015.