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Clear and sufficient but delayed diagnosis of dyslexia and its consequences: The role of ICTs

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Abstract

The present paper deals with the complex phenomenon of dyslexia as a case of learning difficulties, which seems to affect a significant percentage of the student population not only in a Greek, but also in global context. In recent decades, there has been a rapid increase in dyslexia diagnoses among students of all ages and in a broad socio-cultural context. In order for the diagnosis of dyslexia to be feasible, the collaboration of multiple entities is necessary. These entities, in cooperation with local governmental bodies, issue the diagnosis, which is accompanied by a detailed description of the strengths and weaknesses of each student. This information is then provided to educators who work with the particular student.

Keywords: dyslexia; Diagnosis of learning difficulties; Differential diagnosis; Early indicators; Early intervention.

1. Introduction

Due to the complexity of the phenomenon of dyslexia, in conjunction with the high prevalence of comorbidity with other syndromes and difficulties, it becomes clear that the group of specialized professionals conducting the diagnosis requires a significant amount of time to thoroughly identify and record the individual's difficulties. This process aims to facilitate the work of the special educator. However, this time-consuming procedure is often hindered by bureaucracy and the large number of diagnoses requested from the relevant authorities. As a result, the issuance of the official diagnosis is significantly delayed. The fact of this significant time delay poses many risks, as it negatively affects the student on multiple levels. Even when the diagnosis has been completed by the specialists, it may be incomplete, as the individual's assessment was conducted at a different chronological level compared to the later diagnosis that was assigned.

All of these factors make the role of the educator quite challenging, and they can sometimes become disillusioned in various cases. In similar situations, an early intervention program is designed and implemented, which is integrated into the detailed curriculum with differentiation and the use of techniques to facilitate all students in the class, whether they have learning difficulties or not. These programs adhere to the basic principles of sensory learning, early diagnosis, and assessment, based on the principle of inclusive education, and can be applied from the early grades of elementary school, and in many cases, from kindergarten.

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2. Main part

2.1. Definitions- terminology

In order to clarify the above analysis of the phenomenon, it is advisable to briefly present the definition of the term dyslexia, which has evolved through various research stages over the years, depending on the researcher or the scientific perspective they serve. As observed in the educational literature, there has been confusion regarding the definition of dyslexia over the decades, and it varies depending on the researcher or the scientific perspective they adopt. However, it is widely accepted by the educational circles that dyslexia is a disorder closely linked to written language difficulties, and it tends to be fading as a term. Instead, the term "specific learning difficulty" is preferred as it succinctly expresses the heterogeneity of the population with this particular difficulty and the broad range of characteristics it can involve. Specifically, in a survey in the United Kingdom, "the majority, i.e., 87%, expressed their preference for the term 'specific learning difficulties' rather than the term 'dyslexia'" (Stasinós, 2020). Dyslexia, according to Stasinós (2016), is a "super-aged-old" issue because it "has engaged researchers from various disciplines with different scientific backgrounds (humanities, social sciences, health sciences, etc.) for over a century, resulting in rich, diverse, useful, and divergent data.

Taking into account the complexity and overall heterogeneity of the phenomenon, it becomes clear that dyslexia "has various names, depending on the specific case of the child being discussed and the area of difficulty being referred to" (Stasinós, 2020). In an attempt to analyze the above statement, two very important issues emerge. The first and of utmost interest is the extent to which dyslexia affects each individual. In other words, to what degree their difficulties are manifested and whether there are other psychological and socio-cultural factors that may negatively impact the existence of this difficulty. Secondly, it is important to investigate the areas in which problems arise for the individual, in terms of what symptoms are exhibited by students diagnosed with dyslexia, and which cognitive areas do these symptoms affect.

Over time, there has been discussion, from an educational perspective on dyslexia, of "perceptual and motor deficits (visual-auditory perception, sensory integration, oculomotor skills, etc.), (deficient) memory, (deficient) verbal and phonological processing, difficulties in decoding words, fluency, spelling, vocabulary, language syntax, (non) adherence to correct sequence or order of written symbols (sequencing, etc.)" (Stasinós, 2015). Furthermore, other difficulties that children with dyslexia may experience include "difficulty with phonemic awareness, (...) phonological processing, (...), decoding words, fluency, rhythm, spelling, vocabulary, comprehension, and written expression, (...) difficulty in fully understanding what others are saying, difficulty organizing written and oral language, delayed speech development, limited vocabulary acquisition, (...) difficulty learning foreign languages, learning songs and rhythms at a slow pace, slow reading, and a tendency to abandon longer reading assignments, difficulty understanding questions and following directions, poor spelling, difficulty recalling numbers in sequence (e.g., phone numbers and addresses), and finally, difficulty distinguishing right from left" (Tzivinikou, 2015).

2.2. Diagnostic agencies

As indicated by the above information, diagnosing dyslexia is not a simple and routine procedure; rather, it is a complex and time-consuming process that demands the involvement of a team of professionals tasked with the diagnosis. This is what Stasinós (2015) describes as a "dynamic process" rather than a straightforward description of the child's existing relationship with written language. Therefore, it is evident that the diagnosis will involve a comprehensive assessment of the child's abilities and weaknesses, as well as the specific areas of learning where these difficulties manifest. This description should be as detailed and analytical as possible to facilitate the work of the educator, who will take on the task of nurturing specific skills in the child and designing a tailored curriculum that meets the student's needs.

Following a recent change, the diagnosis of learning difficulties as well as other syndromes in the Greek context is carried out by the ΚΕΕΥ (Centers for Diagnosis, Differentiation Diagnosis, and Support), formerly known as ΚΕΔΔΥ (Centers for Diagnosis and Differentiation Diagnosis). Panagis Kassianos, the Director of Special Education at the Ministry of Education, suggests that while "the ΚΕΔΔΥ were responsible for assessing students and providing recommendations for the appropriate educational framework for them, the ΚΕΣΥ, in addition to the responsibilities of the ΚΕΔΔΥ, are also responsible for supporting students within the school environment and strengthening educators to address the special educational needs of their students" (ΑΠΕ-ΜΠΕ, 2018). In the same article, there is mention of a new service created by the Ministry of Education with the purpose of providing continuous support to educators, who will be in close communication with specialized experts in their local ΚΕΣΥ.

The interdisciplinary team that makes up the staff of the KEZY includes special educators, social workers, psychologists, speech therapists, occupational therapists, and physiotherapists, depending on the needs of the local KEZY services across Greece. The interdisciplinary nature of the team of specialists in the KEZY reaffirms the complexity and interdisciplinary nature, not only of learning difficulties but also of all other syndromes included in the DSM-V that require intervention and diagnosis

Another agency that has existed and continues to exist today is the Pediatric-Psychiatric Centers, which "usually were and continue to be autonomous services within hospital settings" (Tzivinikou, 2015). Another point mentioned by Tzivinikou (2015) is that these centers do not have a unified legislative framework for operation, and their functioning is autonomously determined by the local teams that comprise them. Since the legislation does not precisely define the operational framework of these specific bodies, both their improvement and modernization become very challenging.

2.3. Differential diagnosis and delays

The nature of learning difficulties leaves room for misinterpretation of symptoms by educators, who are the first to come into contact with the child. For example, dyslexia can very easily be masked by other syndromes such as Specific Language Impairment (SLI) or Autism Spectrum Disorder (ASD), as the nature of the difficulties in the latter syndromes is much more intense and obvious. Moreover, sometimes the symptoms may be very mild and isolated, not raising any suspicions until the child becomes engaged with written language in the early grades of elementary school, where difficulties in reading and writing become apparent.

A child entering elementary school faces many challenges in terms of written language since they are required to read and write words, syllables, and gradually whole sentences that they can analyze both semantically and syntactically in a short period of time. A child with specific learning difficulties faces many difficulties, and in many cases, insurmountable ones, regarding the requirements of the early grades of elementary school. This often results in reduced academic performance from the student's perspective. However, this should not be confused with problems such as "health issues, poor learning motivation, inadequate study and preparation of the child, adverse living conditions within the family, possible social or other unfavorable factors, prolonged absence from school, etc." (Stasinós, 2016).

Even if a referral is made to the interdisciplinary team of national agencies, a considerable amount of time will have to be spent, in order for all the symptoms and difficulties of the child with dyslexia to become apparent. This is because the child's exposure to written language progresses, making clear both the extent of the difficulties that will be reflected in the detailed diagnosis and also their number. However, as this process takes time and requires the individual's interaction with written language, the demands of elementary school continue to progress accordingly, becoming even more difficult and incomprehensible, as the child struggles with basic language functions.

2.4. Omissions and consequences

The relationship between learning difficulties and their impact on the psychological dimension of children and adolescents is undeniable. Specifically, there is a significant increase in psychological dysfunctions in children and adolescents aged 5 to 15 (Fombonne, 1998. Mental Health Foundation, 1999, as cited in Bimbou-Nakou, n.d.). The percentage of these psychological disorders in children and adolescents has various causes and explanations, which go beyond the scope of this work. However, what is of great importance is the significant impact of learning difficulties on the mental health and well-being of children and adolescents.

Due to deficits in academic performance and communication functions, children with learning difficulties tend to be marginalized, and there are instances when they become the subject of ridicule by their peers. According to research conducted, "students with special educational needs are at a higher risk of victimization compared to typically developing peers" (Dawkins, 1996, as cited in Papaiwannou, 2019). This has many negative effects on their psychology, resulting in severe cases of school bullying, mental disorders among children with learning difficulties, and exposure to highly stressful situations, as they feel they are not performing well and their knowledge is insufficient for success in class.

As Nikolaopoulos (2008) notes, children with some form of learning difficulties are more likely to exhibit delinquent behavior. It becomes evident that this situation is intensified and worsened even further if the diagnosis of the student is pending. This happens because without the proper diagnosis and guidance from educators by specially trained personnel, teachers are unable to implement and carry out tactics and strategies in their classrooms that cater to all students equally. As a result, students with learning difficulties are left behind, unable to follow the detailed curriculum. Therefore, the gap in learning and communication differences between students with learning difficulties and their peers becomes even greater, with negative consequences on their academic performance and psychological well-being

Additionally, the classroom teacher feels helpless in their work as they lack the means and the knowledge to support the specific students. It should also be emphasized that the difficulty of changing and adapting the detailed curriculum on the part of the teacher is significant, and this becomes even more challenging if the diagnosis is not made promptly by the authorities. In such a case, the teacher lacks the means and the help required to design and adapt the material taught to facilitate all students equally, and they themselves feel inadequate. Furthermore, effective teaching becomes more difficult since the communication skills taught cannot be equally acquired by all students, creating a gap between real skills and skills appropriate for the age of the children.

Another very serious negative effect of delayed diagnosis by the Special Education Centers (KESY) is the psychological impact on the family environment of the students. The family plays a crucial role in the presence of learning difficulties, which can "create additional anxiety and fear for parents and require them to face new challenges and adapt to new circumstances" (Giulio, Philipov & Jaschinski, 2014, as cited in Papadiani, 2020). In today's era, parents increasingly have high expectations for their children and expect excellent academic performance. There are also instances where, due to socio-economic backgrounds, they may deny the existence of a problem, fearing social isolation. As Papadiani (2020) states, "even before the birth of the child, parents gradually shape in their imagination the image of the expected child based on their own standards and expectations, and they emotionally invest in this 'perfect' child" (Benedek, 1959). All these elements of family expectations add an additional difficulty to the psychological well-being of children who struggle to succeed in order to gain the approval and acceptance of their parents. Delayed diagnosis or shortcomings in it can have irreversible consequences on the psychology of parents and their acceptance of the existence of difficulties within their families.

2.5. Early intervention - planning and implementation

One way to overcome all the difficulties mentioned above and achieve the maximum benefit for children with learning difficulties is early diagnosis by educators. As evident from the above, a child with learning difficulties exhibits certain characteristics that are apparent from their first encounter with written language, whether it is reading or writing. Therefore, it is quite useful to teach basic skills for handling written text, both reading and writing, to all students in the class. The educational process mentioned above could include simple phonological exercises involving word segmentation into syllables and phonemes, as well as reading comprehension strategies that can benefit all students equally and facilitate the learning process of students with learning difficulties. Teaching can be enriched by using sensory teaching methods and mnemonic techniques that will benefit the entire student population.

Another equally interesting area that educators should focus on is teaching metalinguistic skills to students. Metalinguistic skills include simple and practical advice on how to learn the basics dictated by the curriculum. The adoption of such strategies is essential in the education of children with learning difficulties, as they help them "conquer the process of learning on their own, bypass areas of weakness when they encounter specific academic or other types of problems that cannot be bridged, and be encouraged to become as academically independent as possible" (Panteliadou, n.d.).

One more way in which individuals with learning difficulties can benefit is through instructional assessment. It should be noted at this point that instructional assessment is different from the diagnostic assessment conducted by special education services (KESY). Specifically, instructional assessment governs the entire teaching practice and includes "not only the evaluation of the student but also the evaluation of the teaching environment, which is shaped by factors related to the classroom, teaching, and teaching materials/tools" (Panteliadou & Patsidou, 2007). As suggested by the same authors, instructional assessment is considered a natural process that includes observation, interviews, questionnaires, and scales, conducted at various intervals during the school year, with the aim of making well-documented educational decisions, and the interpretation of the results of this assessment is made in terms of future educational planning. In other words, during the school year, the educator collects data related to the teaching process in order to evaluate their teaching methods, serving as another form of feedback on the effectiveness of their teaching strategies.

3. The ICT's role

In conclusion, we emphasize the importance of all digital technologies in the field of education and in Dyslexia training. These technologies are highly effective and productive and facilitate and improve assessment, intervention, and educational procedures through mobile devices that bring educational activities anywhere [12-15], various ICTs applications that are the main supporters of education [16-35], and AI, STEM, Games and ROBOTICS that raise educational procedures to new performance levels. In addition, the development and integration of ICTs with theories and models of metacognition, mindfulness, meditation, and the development of emotional intelligence [36-43], as well

as with environmental factors and nutrition [44-77], accelerates and improves educational practices and results more than those, particularly in children with Dyslexia, treating domain and its practices like assessment and intervention.

4. Conclusion

In conclusion, it can be emphasized that the diagnosis by competent diagnostic authorities is a crucial step in identifying and addressing learning difficulties in the educational and daily context. It is the most essential and significant step towards designing and implementing a curriculum that fully meets the needs of all students and supports educators in their work. For various reasons, primarily bureaucratic, but also due to the complexity of dyslexia, this diagnosis is often delayed, with multiple consequences both on the psychology and integration of students with dyslexia into the student body, as well as on the psychology of their entire families. For this reason, a comprehensive curriculum should be implemented by the classroom educator, based on the principle of assessing the educational process, sensory learning, and teaching metalinguistic skills. This approach aims to minimize the negative effects of late diagnosis on students with dyslexia. To make this process successful, educators should be informed about these strategies and be able to implement them in collaboration with specialized personnel within the framework of inclusive education.

Compliance with ethical standards

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Disclosure of conflict of interest

The Authors proclaim no conflict of interest.

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