LEARNING FOR CHILDREN WITH DOWN SYNDROME

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Abstract: This article addresses the learning of children with Down Syndrome (DS). The objective was to understand how the teaching and learning process of children with DS occurs and how their limitations can be overcome and/or alleviated. Bibliographical research, with a qualitative, exploratory approach, allowed us to understand the main characteristics presented by children with DS, as well as those that imply learning disorders and, also, about how these subjects learn and which techniques and methods help in their schooling process. During this study, it was possible to observe the importance of mediation in the educational process of children with DS, as well as the means used to stimulate the understanding of educational content and guarantee the same learning opportunities.

Keywords: Down Syndrome. Learning. Schooling.

INTRODUCTION

For many years, the cognitive development of children with Down Syndrome (DS) was considered limited. Over time, several studies have been developed, such as Lima (2016), Antunes (2017), Santos and Paula (2019), Ramos and Müller (2020), Barbieri, Carvalho and Amancio (2020). They

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pointed out that, due to the advancement of technology, through early stimulation, these subjects can have their intellectual performance improved.

This is because the development of a child with DS, according to Menezes and Barros (2010), goes through the same stages as a child without this syndrome, but more slowly, as long as they receive the necessary stimuli to do so.

When it comes to children with DS, early stimulation is an essential factor for them to develop and be successful in their school learning. In this context, the fundamental role of the educator in the teaching and learning process of this individual is understood, since their first contact with reading, writing, and learning is mediated by an adult. Therefore, understanding how the literacy process occurs is essential to know how its limitations can be minimized (SANTOS; PAULA, 2019).

To achieve this objective, a bibliographical research was developed, with a qualitative, exploratory approach, in which the contributions of theorists such as Valett (1977), Pueschel (1993), Freire (1996), Moreira, El -Hani and Gusmão (2000), Brazil (2013), Coutinho (2021).

Carrying out this theoretical survey justifies the need to know how literacy occurs in children with DS, since, as pointed out by Ramos and Müller (2020), it is known that this is a pathogenesis, whose chromosomal imbalance, despite being quite present in people who have this disorder, it allows cognitive development, as long as neuromotor and psychopedagogical stimulation occurs.

Knowing this, it is urgent to research, among other aspects, on how the limitations of children with DS, in their teaching and learning process, can be overcome or alleviated, so that they develop and have their schooling process occur in accordance with what is expected for them. your age and grade of elementary school in which you are studying. After all, all children must be offered the same learning opportunities as others without disabilities, so that they can progress within their potential.

CHARACTERISTICS OF CHILDREN WITH DOWN SYNDROME (DS)

Down Syndrome (DS) or trisomy 21 occurs due to an extra chromosome that enters the cell,

resulting in failed cell division. It was identified, for the first time, in 1958, by the geneticist Jérôme Lejeune, who in his studies came to the conclusion that there was a genetic alteration caused by an error in chromosomal distribution, where, instead of 46, the cells had 47 chromosomes. Furthermore, this extra chromosome was attached to pair 21, hence the name.

As it is a genetically determined human condition, DS is the most common chromosomal alteration or chromosomal disorder in humans and the main cause of Intellectual Disability (ID) currently in the population , and its extra chromosome 21 is responsible for determining specific physical characteristics, as well as developmental delay (BARBIERI; CARVALHO; AMANCIO, 2020).

This genetic disorder, according to Moreira, El-Hani and Gusmão (2000, p. 96), causes people affected by this syndrome to present, among other aspects:

> Very typical signs, such as hypotonia, horizontal line on the palms of the hands, epicanthic folds on the eyes, as well as associated problems such as cardiac and ophthalmological disorders and obesity. This set of signs and symptoms comes from excess genetic material resulting from trisomy 21.

However, DS is not a disease. However, it is a chromosomal disorder that poses multiple challenges, whether to the affected child or their family. At school age, these challenges are also part of the work to be carried out by the teacher in the classroom, from literacy training to the higher stages of teaching.

This is because DS "causes intellectual impairment with varying degrees of physical and cognitive difficulties" (MATOS et al., 2007, p. 78), as is the case, for example, with problems that directly affect your health: congenital heart disease , changes in hearing, vision and cervical spine, in addition to thyroid disorders and premature aging.

Because of this, Pueschel (2005, p. 61) highlights that DS is classified into three types: "trisomy 21, translocation and mosaicism". The first, also known as simple trisomy, is the result of chromosomal non-disjunction of pair 21 that occurs at the time of cell division. Representing 95% of cases; the second, not very significant, as it occurs in around 2% of cases, occurs when the extra chro-

mosome of pair 21 becomes “stuck” to another chromosome. And it is the only case in which it can be hereditary; and, the third, is the one that least affects the intellectual performance of the affected child, since it compromises only part of the cells. Therefore, some cells have 46 chromosomes and others 47. And, it is identified in only 2% of cases.

Regardless of the type of DS classification, it should be noted that chromosome 21 is always the main responsible for its occurrence, its specific traits and the cognitive function affected to a greater or lesser extent, since:

> Its general characteristics, short stature, mental retardation, facial dysmorphia, muscular hypotonia, and/or complications such as congenital heart defect, end up being a common characteristic in the three types of Down Syndrome. In terms of development, Down Syndrome, although sublethal in nature, can be considered genetically lethal when considering that 70–80% of cases are eliminated prematurely (COUTINHO et al., 2021, p. 17935).

Furthermore, the most noticeable physical characteristics of DS in affected children are the slightly smaller and slightly flattened head , which gives it a rounded appearance; the face has a flat contour, with a small nose, eyes and mouth; narrow and slightly oblique eyelids; the roof of the mouth is narrow, the tongue is thick and larger; the jaws are small, the neck is wide and thick; the chest is tapered, the hands and feet are small and thick; the fifth finger is slightly curved inwards and a single fold is observed on the hands; the toes are short, there is a large space between the big toe and the second toe and there is a fold between them and the sole; the skin is generally clear and dry.

These physical characteristics, on the other hand, have no influence on the cognitive development of children with DS. On the contrary, it is the changes caused by excess genetic material in the extra chromosome 21 that “determine intellectual impairment, slow learning, motor difficulties and delays in speech articulation” (MENEZES; BARROS, 2010, p. 02).

Therefore, it is understood , for example, that the curve of the little finger does not limit the function of the hand with regard to holding a pencil, writing, painting. What prevents the skill from being better developed is, most of the time, caused by the presence of hypotonia (decreased muscle

tone), which tends to prevent the child with DS from speaking correctly and being understood easily; or who has better developed fine and gross motor coordination due to poor muscle tone, reduced strength and limited coordination (VALETT, 1977).

Knowing this, it is important to highlight that children with DS, just like any other child without any type of disability, when going through the stages of development, will need to receive adequate stimuli to develop. It is clear that when it comes to your learning process, due to all the limitations, this incentive will require the support of a multidisciplinary team that assists you in its different aspects, since:

> The differences between people with DS, both in physical and developmental aspects, arise from individual genetic aspects, clinical complications, nutrition, stimulation, education, family and social context and environment. Despite these differences, there is a consensus in the scientific community that degrees cannot be attributed to DS, just as its life expectancy has increased considerably, due to progress in the area of health, especially cardiac surgery. The increase in survival and the understanding of its potential has led to the development of different programs educational, with a view to schooling, professional future, autonomy and quality of life (BRASIL, 2013, pp. 09-10).

And that is why we believe in the importance of knowing how DS occurs in its pathogenesis, in order to understand which forms of learning can help in the cognitive development of the affected child. This is necessary because the biggest limitation for them to become integrated, productive, happy and independent adults, for example, is not imposed by genetics, but rather by the lack of knowledge of the people who work with these subjects, whether at home, in the school, or in the different social spaces that currently exist.

It is by taking this as an assumption that it is reaffirmed that children with DS can both learn and develop (LIMA, 2016). It is necessary, however, to allow, among other aspects, access to techniques and strategies for more effective treatments and therapies, where early stimulation, through pedagogical, physiotherapeutic and speech therapy actions, are some of the mechanisms that have contributed, directly and significantly, to improve the quality of life and facilitate the carrying out

of activities in the social, emotional and work context , as well as school, as will be better described below.

THE TEACHING AND LEARNING PROCESS OF CHILDREN WITH DS

It was previously seen that Down Syndrome (DS) is not a disease, but a permanent condition. And, like any other person, a child with this genetic alteration has abilities and difficulties that can be increased or reduced depending on the interventions received and/or carried out.

Therefore, knowing that schooling is an important process in the training of all individuals, Antunes (2017) points out that it is common for these individuals, even without any type of disability, to have some degree of difficulty learning. When it comes to children with DS, it is known that these difficulties become even more challenging, precisely because of the genetic load, environmental factors and the Intellectual Disability (ID) that affects them.

Therefore, it is essential for their intellectual development and academic progress that children with DS receive the necessary attention during their teaching and learning process, since "the potential to be developed is always a frontier to be crossed daily" (BRAZIL , 2013, p. 10).

As part of the teaching and learning possibilities to be offered at school by the teacher, Moreira, El-Hani and Gusmão (2000) point out that, to allow not only the enrollment and access of children with DS to regular education, but also , their permanence and academic progress, it is necessary to know their limitations and potential, so that, based on this, the necessary curricular adaptations can be made for their schooling to occur.

However, it is necessary to understand that learning for children with DS, as well as from one individual to another, does not occur in the same way. I.e:

> There is no standard for people with DS, depending on the degree of stimulation, some can perform tasks more easily than others, but it is a consensus that, when stimulated, they show progressive development both in day-to-day tasks and in social relationships, since intellectual development is slower

(MATOS et al., 2007, p. 83).

Knowing this, one must start from the premise that it is precisely the differences that can be used as a starting point to obtain increasingly positive results in the teaching and learning process. To achieve this, it is necessary to develop appropriate strategies and cognitive processes that provide children with DS with different opportunities for academic progress.

The basic principle is to know that children with DS have a chronological age that is different from their functional age. Therefore, to feel encouraged to learn, Santos et al. (2022, p. 109) encourages that:

> She needs to feel welcomed and productive. However, to have a welcoming environment it is necessary for it to be balanced, with targeted planning with adaptations and in a facilitated way, to provide the Down child with pleasant moments, thus being able to fulfill their constructions about their reality. Down syndrome children have many weaknesses and limitations, so pedagogical work must primarily respect the child's rhythm and provide them with adequate stimulation to develop their skills.

This means that, in order to learn, children with DS need to be encouraged to live together, interact and participate in everything that is proposed. And, if you are unable to keep up with others, these experiences need to be adapted to your reality, respect your limits, and be in line with your potential.

Because children with DS are able to participate in all the learning possibilities offered to them. Therefore, we agree with Matos et al. (2007) by highlighting that stimulation is extremely important for their integral development, as it is one of the main factors responsible for minimizing the occurrence of learning deficits.

It should also not be forgotten that the establishment of interpersonal and intrapersonal relationships in the school environment goes beyond the simple act of inclusion. It allows you to engage, understand, participate and learn. And, because of this, specific procedures need to be planned and

used to achieve success in the teaching and learning process (FREIRE, 1996).

From this perspective, it is very important to understand how children with DS learn and, therefore, develop. And, based on this, strategies must be devised on how to help her in her schooling process , as it is known that, in addition to ID, there are marked difficulties in her "psychomotor and weight-height" development, which is why the institution of multiple professionals earlier can help in the better development of these individuals" (COUTINHO et al., 2021, p. 17945).

Therefore, the statement by Pelosi et al. (2018) continues to be the case that the earlier the child with DS is stimulated, the greater the positive impact will be on their development in the different aspects affected or not by the genetic alteration. Among all the existing possibilities, different techniques and teaching methods that promote learning, inside and outside school, stand out.

In any case, it is reaffirmed, once again, that the schooling of children with DS is extremely important for their development. Therefore, for this moment to occur as expected, it is necessary that the school, and therefore the teacher, knows how to act with this subject, as one of the possibilities for better service in the teaching and learning process is, without a doubt, the adequacy of techniques and methods that can expand knowledge. For better understanding, in the following subtopic, some of the work that can be carried out will be presented.

LEARNING TECHNIQUES AND METHODS APPLIED TO CHILDREN WITH DS

It is a proven fact that children, with or without Down Syndrome (DS), must be encouraged to learn progressively. From the beginning of their schooling process, this work must focus on their integral development, as well as meeting their limitations and strengthening their potential.

Developing work from this perspective will help, for example, in better understanding and making use of school content and, consequently, in rearranging the teaching and learning process. Therefore, it is extremely necessary, as seen so far, through this theoretical framework, that the school, and, consequently, the teacher, who is the one who works directly with the students, has knowledge

of the most diverse mechanisms, techniques, methods and strategies that promote student learning (PELOSI et al., 2018).

When it comes to children with DS, there are several learning techniques and methods that can be applied, inside and outside the classroom, to help with their development. These tools and strategies are, according to Santos et al. (2022), elements that not only facilitate their schooling process, but also help in their interaction and social integration.

Knowing this, Pessoa and Timbó (2018, p. 68) encourage that for a child with DS to develop fully, the school, and therefore the teacher, plays an important role, and, as such, must:

> Offer significant learning opportunities for these children, such as attention to their native language, basic concepts of mathematics, manual work as a means of educating them and qualifying them for a profession. [...]. As a complement to the aforementioned activities, we can also see the significant change that symbolic game activities can represent for quality of life and autonomy. As examples of these activities, we can mention: preparing a sandwich, making the bed, sweeping the room, washing clothes, organizing the books. By becoming "autonomous" in small activities, they will soon interact more with their family and society and will be able to develop fully.

This need to offer different and varied forms of learning is not only important at school, but also directly interferes in everyday life at home and in the social environment, since by developing fully, children with DS will have a greater autonomy to carry out other related activities, such as, for example, exercising a profession, helping with domestic activities, and achieving higher levels of education than Basic Education.

To achieve this purpose, it is up to the educator to employ the most varied techniques and teaching methods that make it possible to enhance the skills already acquired by the child with DS. However, for this to happen it is necessary to have a more sensitive look to understand what its limitations are and use this as a starting point for interventions (MENEZES; BARROS, 2010).

Realizing the potential of children with DS makes it possible for the teacher to apply different teaching strategies and, consequently, helps to solve, and/or alleviate, possible learning difficulties

presented during their schooling. After all, “this process will only come to fruition if there is the development of skills and competencies, which will influence your school trajectory” (PESSOA; TIMBÓ, 2018, p. 68).

Knowing this, it is illustrated, as part of the teaching techniques and methods that directly help in the learning of children with DS, among other aspects, the use of concrete materials, carrying out practical experiments, the application of games, imitation and reinforcement of behaviors, as a basic premise for their integral development (BRASIL, 2013).

The application of teaching techniques and methods such as those mentioned are important because it is known, for example, that the vocabulary of children with DS develops as a result of experiences and neurological integration; language is strengthened by offering opportunities for communication, interaction, integration and socialization; communication is improved through imitation, the use of concrete material, games (VALETT, 1977).

As can be seen, learning will only happen if there is engagement towards this objective, as highlighted by Santos et al. (2022, p. 109):

> Educational opportunities must be offered to all students, equally, even if this represents a challenge. Furthermore, childhood is the ideal context for the inclusion of children with DS to occur at school, as at this stage there is language exposure through interactions, emphasizing the elements of social insertion and autonomy as therapeutics to avoid delay. in development. Therefore, methodologies must be based on these elements.

It is, therefore, about knowing the possibilities and limitations of children with DS, and from this, proposing educational opportunities that help them in their schooling process, so that they have the same conditions of access to school knowledge and develop fully. , even though it is not as easy a task as you might imagine.

It should also not be forgotten that what differentiates, in most cases, the learning of a child with DS from that who does not have any disability, is the type of stimulus used and the time it takes for each child to learn what is relevant to them. taught, even because “the child’s effort will depend on

their level of motivation to carry out the activities" (PUESCHEL, 1993, p. 249).

It is therefore up to the teacher, among other aspects, to research techniques and strategies that they can apply to children with DS, and, if they are still not sufficient to meet their specific needs, they must adapt them to make it possible to achieve the greater objective. which is learning (RODRIGUES; FREITAS, 2019).

A good alternative, according to Pessoa and Timbó (2018, p. 09), is precisely to use more playful and interactive approaches, since:

> They encourage the development of motor skills and the construction of meaningful learning about the subject that will be or has been discussed in the classroom. This type of action is viable because it is flexible, provides complete involvement of the student, and has a creative influence on the child's imagination, which breaks with the traditional method of regular education.

This is an approach that can be used inside and outside the classroom, as well as being applied at any time in the educational process, as it motivates children with DS to want to learn, to be interested in what is being proposed and to interact more. easily with the knowledge and with the other students who live with her at school.

From this perspective of understanding, another methodological strategy option that helps children with DS in their schooling process is the establishment and application of a daily routine that can be done through the use of illustrative sheets that indicate the activity that should be performed , enabling the development of communication and understanding skills that are so necessary for access to school knowledge (SANTOS et al., 2022).

Each of these teaching strategies and techniques, according to Rodrigues and Freitas (2019), in addition to being necessary, must comprise the entire schooling process of these students, including assessment and the instruments used for this, as performance of each child with DS must be recorded individually, analyzed and scored, since it is from this that new work tools are designed to better help with their academic development.

Finally, it is worth noting that the success of the schooling of children with DS is not yet that effective because there is a lack of real depth on the techniques, strategies and methods that can best be addressed in the school environment that facilitate their teaching and learning process, as well as a greater understanding of the rights, particularities and needs of these subjects as a starting point for meeting their potential.

CONCLUSION

The literary review carried out around the learning of children with Down Syndrome (DS) proved to be relevant as it allowed us to understand which genetic changes directly affect their cognitive, academic and social development, how their schooling occurs and what techniques and methods help in this process.

It was evidenced, among other aspects, that children with DS, despite all the genetic changes caused by the syndrome, such as Intellectual Disability (ID), can develop fully, as long as they are offered all the learning possibilities that possible and that meet her limitations and potential, even though she advances differently than other students without any type of disability.

To achieve this, it was concluded that it is necessary for the school, and therefore the teacher, to know very well how DS manifests itself. Once with your student, survey their limitations, difficulties and potential, as this will help you draw up the most appropriate work plan.

With this information, carry out an in-depth analysis of the techniques, methods and teaching strategies that best suit the reality of the child with DS enrolled in your class, as to promote their learning and integral development, it will be necessary to invest in dynamic forms of teaching. different from the traditional ones applied on a daily basis.

As a result of this personal search, the learning of the child with DS will occur, not in the same way as other students. But, it will happen considering your reality, and will be the starting point for higher stages of teaching to be reached. The success will be even greater if the teacher has the

support of the family and other professionals who work in the therapeutic and teaching and learning process of these subjects, as it is known that it is not just the cognitive capacity that is affected. There are other skills that are affected and require attention, as they also directly impact their schooling and development outside and inside school.

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