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Abstract

Down syndrome, or chromosome 21 trisomy, is a genetic change that occurs at the time of conception of a child. People with Down syndrome have intellectual disabilities, this fact contributes to social exclusion, isolation and impairment in their development, since there is much social prejudice regarding this syndrome. Considering the need to include children with Down Syndrome In schools this research aimed to promote a reflection on the process of inclusion of these people in Brazilian schools through the assistive technologies used. This research is an integrative literature review where the search took place in databases of greater relevance to the subject. The exact descriptors of medical subject titles were used in English using "Mainstreaming (Education)", "Down Syndrome" and "Schools" and in Portuguese the exact descriptors in the health sciences "Educational Inclusion", "Down Syndrome" and Schools". The results showed that the insertion of the child is only physical and only due to the obligation promoted by the current national legislation. Social inclusion does not occur in such a way as to integrate students, teachers and technicians, and teachers are unprepared to drive inclusion due to limitations in their education, lack of incentive to qualification, school infrastructure and large numbers of students in the classroom. In accordance with this reality, this paper aims to promote a reflection on the inclusion of students with Down syndrome in Brazilian schools, through the discussion and development of appropriate assistive technologies for this process to occur effectively.

Keyword: Down syndrome, Educational inclusion, Schools, Assistive Tecnology.

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ABSTRACT

Down syndrome, or chromosome 21 trisomy, is a genetic change that occurs at the time of conception of a child. People with Down syndrome have intellectual disabilities, this fact contributes to social exclusion, isolation and impairment in their development, since there is much social prejudice regarding this syndrome. Considering the need to include children with Down Syndrome In schools this research aimed to promote a reflection on the process of inclusion of these people in Brazilian schools through the assistive technologies used. This research is an integrative literature review where the search took place in databases of greater relevance to the subject. The exact descriptors of medical subject titles were used in English using "Mainstreaming (Education)", "Down Syndrome" and "Schools" and in Portuguese the exact descriptors in the health sciences "Educational Inclusion", "Down Syndrome" and Schools". The results showed that the insertion of the child is only physical and only due to the obligation promoted by the current national legislation. Social inclusion does not occur in such a way as to integrate students, teachers and technicians, and teachers are unprepared to drive inclusion due to limitations in their education, lack of incentive to qualification, school infrastructure and large numbers of students in the classroom. In accordance with this reality, this paper aims to promote a reflection on the inclusion of students with Down syndrome in Brazilian schools, through the discussion and development of appropriate assistive technologies for this process to occur effectively.

Keywords: Down syndrome, Educational inclusion, Schools, Assistive Tecnology.

INTRODUCTION

Langdon Down, an English physician who identified trisomy of chromosome 21 in syndromic patients in 1866, first described Down syndrome (Schwartzman, 2003). The trisomy of chromosome 21 causes

intellectual disability, microcephaly and low implantation of the ears (Piato, 2009).

The frequency of occurrence of the syndrome is one for every 700 to 750 live births (Sherman *et al.*, 2007). Maternal age above 35 years is a risk factor (Gusmão, Tavares and Moreira, 2003). The person with Down Syndrome presents characteristics in different degrees, because it depends on the way they were stimulated in their development. Constant stimulation for development promote greater learning capacity and sociability (Santos and Santana, 2016).

The family and school play a key role in the child's learning. According to Abramowicz (1997) the school can welcome differences and teach through a pedagogy that is a new way of relating to knowledge, to students, to parents, to community, to failures and to their end whereas in this context, the concept of inclusion is interesting. For Aranha (2002) it is a process of affiliation, combination, comprehension, involvement, contenance, surrounding, that is, to invite those who are not inserted in a social context to enter and share knowledge, abilities and also difficulties, as companions and members. Inclusion is to promote the right to citizenship, to participate in society.

In the world context, the United Nations Organization advocated the inclusion of people with special needs through the Salamanca Declaration, which referred to social inclusion and participation as essential to human dignity and the exercise of human rights (UNESCO, 1994).

In Brazil the Federal Constitution, instituted in 1988, guarantees the process of inclusion of childrens with Down Syndrome and the right to education by Law Guidelines and Bases of National Education (LDBEN n° 9394/96) that establish those people with special needs have the right to education in Brazilian schools. This right is independent of physical, intellectual, social or emotional conditions, and should be free and started since Child Education and extend throughout life (Brazil, 2018).

The inclusion of the child with Down syndrome should not be only physically, but in the context of special education that according to Dellani and Moraes (2002) is a teaching modality that aims to promote the overall development of students with disabilities, respecting individual differences, and ensuring the exercise of citizens' rights.

In Brazil, more than 40 million people have special needs 1 million are enrolled in Brazilian schools according to data from the latest Brazilian sense of school (Brazil, 2019).

Taking into account the need to include students with Down Syndrome, the following guiding question guided this review: How are the inclusion of children with Down Syndrome in Brazilian schools? This question aimed to understand how this process occurs in Brazilian schools, whether it has effectiveness and what assistive technologies are used to include this population.

The purpose of this work is to promote a social reflection on the subject in order to favor the inclusion of children and students with Down Syndrome.

This study is an integrative literature review that aimed to understand and promote a reflection on the process of inclusion of these people in Brazilian schools, its effectiveness and assistive technologies used.

MATERIALS AND METHODS

The integrative review is used in studies aiming to broaden the understanding about a certain subject. This integrative review utilized the five steps proposed by Whitemore and Knafl (2005) described below:

First stage - Identification of the problem: The problem was identified by variables of interest of the guiding question: "How are the inclusion of students with Down syndrome in Brazilian schools?"

Second stage - Literature search: The search in the literature was done through exact descriptions of Medical Subjects Headings (MeSH), in English, being used "Mainstreaming (Education)", "Down

Syndrome" and "Schools" and similarly in Portuguese, the Exact Descriptors in Health Sciences (DeCS) "Inclusão Educacional". "Síndrome de Down" and "Escolas". The search for the studies were through the combinations between the descriptors using the Boolean operators AND and OR.

The databases used were the most significant for the thematic, being: Latin American and Caribbean Literature in Health Sciences (LILACS), Eletronic Library Online (SciELO), Directory of Open Access Journals (DOAJ), PubMed and Web of Science.

Included in this review were articles that were complete and available online, written in Portuguese, English and Spanish, from January 2008 to May 2019. The articles should answer the guiding question of this study.

After search in the databases, the reading of the title, abstract and keywords was carried out to select the studies. The selected studies were read in their entirety, of which the respondents to the guiding question comprised the final sample of this study.

Third stage - Data evaluation: The authors formulated an instrument with the following variables: database, author(s) and article title, periodical and year of publication, type of study and educational institution, city and/or region of the Brazil to carry out the study, objective and main results.

Fourth stage: Data analysis: This step resulted in the following categorizations: Characterization of the sample; Evaluation of articles; Social inclusion and the school inclusion of the student with Down syndrome; The school, teachers and parents in the inclusive process.

Fifth stage: Presentation of the results through the elaboration of this article, which presents in a clear and concrete form the integrative review, putting all the elaborated stages, results and conclusions.

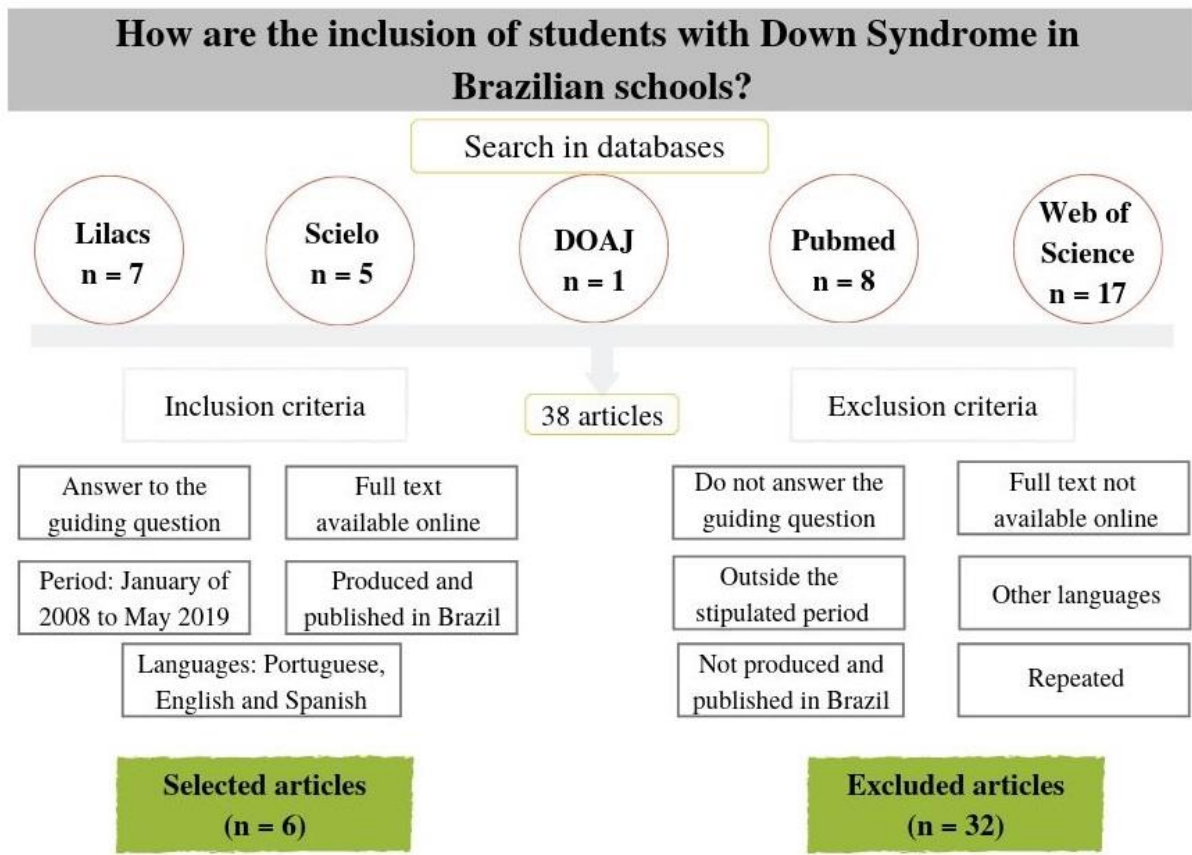
RESULTS AND DISCUSSION

Characterization of the sample

The search in the databases through the descriptors resulted in 38 articles. Of these 27 did not answer the guiding question of this study, remaining 11 studies, being that some of them did not meet the inclusion criteria and others were repeated in the databases, being excluded. Finally, 6 articles were selected that compose the final sample of this review.

When searching the databases with descriptors and Boolean connectors, we obtained: LILACS (7 articles), SciELO (5 articles), DOAJ (1 article), PubMed (8 articles) and Web of Science (17 articles), totaling 38 articles. LILACS and SciELO presented a higher number of articles corresponding to the interest of this study, however, the 4 articles selected in the SciELO database and the study in the DOAJ database were found in LILACS, excluding SciELO and DOAJ. PubMed and Web of Science databases did not result in final sample work. The figure (a) below shows the selection flowchart of the articles of this integrative review.

Figure a: Flowchart of the selection stage of the articles that make up the integrative review sample.



Source: Prepared by the authors (2019).

3.2 Evaluation of articles

The six articles that were part of this integrative review were evaluated according to the following variables: database; author (s) and title of the article; periodical and year of publication; type of study and nature of the educational institution; city and / or region of Brazil where the study was conducted; goal; and main results. This analysis is described in figure b.

Figure b: Evaluation Of the articles according to the selected variables

BASE	Author (s) and article title	Periodical and year of publication	Type of study and nature of the educational institution	City and/or region of Brazil where the study was conducted	Objective	Main results
LILACS	TEIXEIRA, F. C.; KUBO, O. M. Characteristics of the interactions between students with Down syndrome and their classmates in the regular system of education.	Brazilian Journal of Special Education, 2008.	– Cross-sectional qualitative study; – Private school.	– Medium-sized city not mentioned; – South region.	To characterize the interactions between students with Down Syndrome, inserted in the regular system of education, and their classmates.	– The greater the academic development and the degree of participation in the activities, the greater the possibility of the student with the syndrome to be considered friend; – The classmates are more recognized, both positively and negatively, and have a negative expectation about the possibility of the DS student doing a college.
LILACS	OLIVEIRA-MENEGOTTO, L. M.; MARTINI, F. O.; LIPP, L. K. Inclusion of students with Down Syndrome: teachers' discourses.	Fractal: Journal of Psychology, 2010.	– Qualitative, exploratory study; – Public and private school.	– Novo Hamburgo, RS; – South region.	To discuss the discourses of school teachers from the city of Novo Hamburgo / RS on the inclusion of students with Down Syndrome.	– They express feelings of helplessness, impotence and incompetence in the face of inclusion; – Lack of space for discussion and training on the subject.

Figure b: Evaluation of the articles according to the selected variables (continuation).

BASE	Author (s) and article title	Periodical and year of publication	Type of study and nature of the educational institution	City and/or region of Brazil where the study was conducted	Objective	Main results
LILACS	FERRAZ, C. R. A.; ARAÚJO, M. V.; CARREIRO, L. R. R. Inclusion of children with Down Syndrome and cerebral palsy in elementary school I: comparison of the reports of mothers and teachers.	Brazilian Journal of Special Education, 2010.	– Cross-sectional qualitative study; – Public school.	– Unnamed city of the great Sao Paulo. – Southeast region.	To know the process of inclusion of the student with Down Syndrome and Cerebral Palsy, from the comparison of the discourses of parents and teachers, and with that, to evaluate how the communication between them can affect the inclusion process.	– Opportunity for inclusion to reduce prejudice; – Expectation of parents when enrolling the child in regular education in the possibility of learning to read and write at least the name; – Teachers do not feel ready for inclusion; – Even without resources, they work for learning.
LILACS	ALVES, M. L. T.; DUARTE, E. The participation of students with Down Syndrome in School Physical Education classes: a case study.	Movement Journal, 2012.	– Case study. – Public school.	– Campinas, SP; – Southeast region.	Observe the reality of the inclusive process of children with Down Syndrome (DS) in school physical education classes.	– The student with DS had difficulties to participate socially with the class; – The student with DS did not present difficulties to understand and perform the activities proposed in class.

LILACS	KIBRIT, B. Possibilities and challenges in school inclusion.	Latin American Journal of Fundamental Psychopathology, 2013.	– Case report. – Private school.	– City and region not mentioned.	Framing a vision about the concept of inclusion in order to more consistently see it in the context of the school environment.	– The school was not prepared to receive a student with DS; – The class assistant was responsible for therapeutic and inclusive monitoring; – Teachers did not prepare adequate materials for the student.
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Figure b: Evaluation of the articles according to the selected variables (conclusion).

BASE	Author (s) and article title	Periodical and year of publication	Type of study and nature of the educational institution	City and/or region of Brazil where the study was conducted	Objective	Main results
LILACS	ALVES, M. L. T.; DUARTE, E. Social inclusion and the student with Down syndrome: a case study in Physical Education classes.	Think Practice Journal, 2013.	– Qualitative case study. – Public school.	– Campinas, SP. – Southeast region.	To analyze the participation of students with intellectual disabilities, specifically with Down Syndrome (DS), during school physical education classes.	– The student with DS found difficulties to interact with peers during physical education classes; – The student with DS has demonstrated important limitations in structuring social relationships.

Source: Prepared by the authors (2019).

Social inclusion and school inclusion of the student with Down Syndrome

The school has the role of promoting social relations among students, but when these relationships involve students with Down Syndrome, Teixeira and Kubo (2008) have shown that they are not effective. The authors describe that in a school with 4 students with Down syndrome, 3 did not receive any indication as "friend" by their classmates, this fact is worrisome to be able to lead to social isolation and discrimination.

Another fact verified was that students with Down Syndrome presented a school delay in relation to the other students, verified by the age difference of the students with the average age of the students of the class (Teixeira and Kubo, 2008).

The school can be considered an assistive technology for the inclusion of these students, another technology that can be used are physical education classes that promotes student interaction. Alves and Duarte (2013) verified this interaction, but students with Down syndrome presented limitations to participate socially with the class due to the difficulty of students with disabilities to reach the place of the physical education class.

Alves and Duarte (2013) applied the sociometric test proposed by Moreno (1994) at the beginning and end of the school term in order to obtain an indicator of acceptance of the student with Down syndrome. A question was asked for the third grade class about who they liked and did not like to play in physical education classes, and even the Down Syndrome student had increased his degree of empathy with the students in his class and had not been rejected by no colleague, social status relative to his colleagues was classified as ignored.

Socialization in the process of social inclusion is important, but it is not the only concern of mothers and teachers as Ferraz, Araújo and Carreiro (2010) conclude. Parents' expectation is that their children with Down Syndrome enrolled in schools will also learn to read and write.

It is understandable the concern of parents and teachers in the context of pedagogical learning, but there are barriers that surround this process, one of them is the teacher's unpreparedness and inadequate physical structure of the schools (Oliveira-Menegotto, Martini and Lipp, 2010; Block and Obrusnikova, 2007).

School, teachers and parents in the inclusive process

The articles selected in this review, 100% (n = 6) cited the school's influence on the inclusion process.

The school can provide different types of interactions and learning among students, this is part of the inclusive process, but only the physical interaction does not guarantee this inclusion (Teixeira and Kubo, 2008; Oliveira-Menegotto, Martini and Lipp, 2010).

The inclusion process should favor the student to reach a degree of knowledge and intellectual development, in addition to maintaining a good social relation with their peers. This process should involve the school and parents, but Kibrit (2013) found that parents do not always care about this inclusion process.

Schools are strictly concerned with complying with the law and pass this responsibility on to the teachers, they assume the role of including the student, adapting activities and having greater concern to promote education, respecting the limitations of the student (Kibrit, 2013).

Planning an appropriate curriculum and making pedagogical adaptations to the needs of each student is an outcome presented by Oliveira- Menegotto, Martini and Lipp (2010) to favor an effective inclusion of students with Down syndrome.

The teachers do not feel prepared to attend the students with special needs, this fact is justified due to their inadequate training, noting that the discussion about Inclusion of students with disabilities began in the 1990s (Oliveira-Menegotto, Martini and Lipp, 2010).

Unprepared teachers maintain a negative attitude toward the student who needs care (Block and Obrusnikova, 2007). It is then necessary to approach this subject in teacher training and its exploration in the practical context to better elucidate the educational processes that involve them (Gilmore, Campbell and Cuskelly, 2003).

Teachers' lack of preparation for the activities carried out with students with Down's syndrome leads to a feeling of dissatisfaction for not reaching their goal Ferraz, Araújo and Carreiro (2010).

The unpreparedness of the teacher is evidenced by the absence of specific materials and activities for the student with Down Syndrome ((Oliveira-Menegotto, Martini and Lipp, 2010; Ferraz, Araújo and Carreiro, 2010 and Kibrit, 2013).

Alves and Duarte (2012) report that despite the difficulties, the relationship between teachers, students and parents is satisfactory. The parents maintain direct contact with the teachers through agendas, becoming aware of the events in the school, in addition there are meetings to approach the subject (Ferraz, Araújo and Carreiro, 2010).

The inclusive process of Down Syndrome students is directly influenced by the school, teachers and parents. The school should provide a suitable environment for students, teachers carrying out pedagogical actions capable of promoting learning and parents in the participation and full monitoring of school activities.

FINAL CONSIDERATIONS

This study had as limitation the small number of studies that approach the subject of the inclusion of the children with Down Syndrome in Brazilian schools, so this study portrayed only a small part of this population.

The results found were important demonstrating that the inclusion of students with Down syndrome occurs in public and private schools and only to the detriment of the laws.

Teachers face difficulties such as the unpreparedness of inadequate training to deal with students with Down syndrome and the inadequate infrastructure of schools in addition to the large number of students in the classroom.

Inclusion is a process that must be carried out by the school that must plan ways of teaching that are appropriate to the needs of each student, by the teachers who must have adequate training to attend the students with efficient educational practices for all, and also by the parents who should participate in the process of educating their children.

Este estudo sugere a realização de mais estudos que explorem a inclusão de alunos com Síndrome de Down no cenário da educação brasileira em diversas regiões para que se possa conhecer melhor o processo de inclusão dos alunos com Síndrome de Down.

This study suggests further studies exploring the inclusion of Down Syndrome students in the Brazilian education scenario in several regions in order to better understand the process of inclusion of Down syndrome students.

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