

Involvement of parents in the psychomotor management of behavioral disorders in autistic children aged 3 to 10 years in a specialized center in Yaoundé, Cameroon.

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Abstract

Autism is an early developmental disorder of neurological origin, with behavioral disorders and disturbances in communication and interaction. It affects 90 to 120 individuals out of 10,000, with a sex ratio of one girl for every four boys. This disability, which cannot be cured but whose symptoms can be alleviated, is generally diagnosed when the child is three years old. However, the signs appear much earlier, in the first year of life, and can be reduced just as quickly if treated early. There is a range of appropriate methods for managing autism, including parental guidance. However, parents who are insufficiently aware of autism unfortunately pay little attention to its manifestations. The aim of this study was to highlight the impact of parental guidance on the attenuation of behavioral disorders in autistic children. The parameters evaluated were the parents' knowledge and involvement, as well as the patients' abilities and weaknesses. Parents were interviewed on the basis of a pre-tested and validated questionnaire. A psychomotor assessment was carried out on the patients before and after the treatment, which consisted of parental guidance with follow-up at home. We had two patients: a ten-year-old girl and a six-year-old boy. Both patients were diagnosed as autistic and had behavioral problems. They were cared for over a three-month period. Although some parents (35%) knew what autism was, others (65%) mistook it for an infectious or even mystical disease. All parents surveyed (100%) knew at least one of the warning signs of autism. A few parents (23%) were completely unaware of whom to consult for a case of autism. Almost all the parents (91%) had never experienced care with parental guidance and follow-up at home. What's more, half (50%) of the parents did not attend their child's sessions regularly. The study of the "X" and "Y" cases showed that the treatment was effective in improving their behavior and their relationship with their parents. This improvement in behavior was due to the increase in their abilities and the involvement of their respective parents in the treatment.

Keywords: Autism, behavior disorders, parental guidance, psychomotricity.

1. Introduction

Autism or Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder of biological origin that manifests itself early in childhood. It is characterized by a symptomatic triad of absence or disorder of social interaction, absence or disorder of verbal or non-verbal communication and repetitive or stereotyped activities (Leclerc and Charbonnier, 2015). The manifestations of this disorder in children, as well as its impact on family members, constitute a set of challenges that parents must face. They will go through the various stages that make up the process of mourning the "ideal" child. Next, parents will experience a lessening of their negative emotions, leading to a reorganization aimed at adapting to the child's condition. This last phase involves the mobilization of parents, who will use the help, support and services available to best help their child (Martin et al., 1993; Hayes et al., 2013). Pervasive Developmental Disorders (PDD) encompass a variety of clinical situations, leading to heterogeneous disability situations. This clinical diversity can be specified in the form of categories or dimensional forms of ASD, as proposed by the American classification in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V). The DSM-V classifies ASD as a neurodevelopmental disorder characterized by persistent deficits in communication and social interaction observed in a variety of contexts and a restricted and repetitive nature of behaviors, interests or activities, the severity of which is specified according to the level of help required by the person in these different areas (Mc Partland et al, 2012). Some authors state that symptoms can vary (intensity, onset/disappearance) depending on the age of the person affected and the time of onset of the condition (Williams and Wright, 2010). Behaviors also vary from one person to the next. It is on the strength of this observation of the heterogeneity of the characteristics of people with autism that it is asserted that there are as many forms of autism as there are people with autism. Studies show the presence of related disorders or symptoms often associated with ASD, and this is referred to as comorbidity (HAS, 2010), (Simonoff et al, 2008). ASD appears in children mainly before the age of three and is sometimes detected at school entry, but the diagnosis can only really be made from the age of three onwards. A number of studies have shown that almost 40% of people with autism have a below-normal IQ and intellectual disability (Simonoff et al, 2006). Autism has major consequences because it affects the development of relationships in families and social groups, and there is uncertainty about its causes and the choice of therapeutic and educational methods. However, in the wake of Kanner's work, the etiology of these disorders was the subject of new conclusions from the 1960s onwards. The focus then shifted to multifactorial causes: genetic, neurobiological and environmental (Fédération Québécoise de l'autisme, 2019). The diversity of clinical pictures led to the need for individualized programs based on a global assessment of the child's difficulties and abilities. (Aussilloux et al, 1998). However, a number of constraints compromise the success of the treatment, including irregular attendance by some children at treatment sessions, poor hygiene on the part of some children when they attend treatment sessions, neglect of recommendations and the absence of a close relative to accompany the child to treatment sessions. This raises the question of family involvement in the care of their child with ASD. The aim of the present study is to highlight the impact of parental guidance on the attenuation of behavioural disorders in children with autism. More specifically, it involved assessing parents' knowledge of ASD, evaluating family involvement in the care of autistic children, determining the degree of severity of ASD, carrying out a psychomotor assessment of patients and setting up a specific work program for each patient with parental guidance at home.

2. Literature review

2.1. Autism

History and definition

The term "autism" was first used by Swiss psychiatrist Eugène Bleuler in 1911, when he described the withdrawal of schizophrenia. Bleuler's choice of this term can lead to confusion, as autism and schizophrenia are two quite distinct disorders despite similarities in their clinical description (Pignol, 2014). The term "autism" is derived from the Greek "autos" meaning "self". During the 19th century, autism was considered to be the result of impaired intelligence development. In 1943, Léo Kanner used the term "autism" to describe infantile autism. This disability is characterized by autistic withdrawal, the need for immutability, stereotypies and behavioural oddities, language disorders and a subjective impression of intelligence. Infantile autism is generally identified during the child's first 36 months of extra-uterine life. (Carron, 2006). For several decades, autism was considered a psychosis and treated with psychoanalytic therapy. Bruno Bettelheim emphasized the fact that autistic children experience fear as a result of a negative interpretation by the child of affects coming from the characters most significant to him or her, with no possibility of setting up defensive processes against this anxiety to attenuate its intensity. (Ferrari, 2004). At the time, autistic children were placed in institutions, provoking immense guilt in their parents. Since the 1980s, autism has been classified as a Pervasive Developmental Disorder, i.e., a disorder that alters the development of major psychological functions. According to the current DSM-IV, autism comprises three main diagnostic criteria: qualitatively impaired social interaction, qualitatively impaired communication, and restricted, repetitive and stereotyped behaviours, interests and activities. (American Psychiatric Association, 1996).

Classification and manifestations

The DSM is the psychiatric manual founded by the American Psychiatric Association (APA). According to DSM-V, a revised version of DSM-IV, the clinical triad of autism is defined by qualitatively impaired social interaction, qualitatively impaired verbal and non-verbal communication, and restricted, repetitive and stereotyped behaviours, interests and activities. There is also a frequent association with specific cognitive functioning, with or without mental retardation. This symptomatology is found before the age of three. In the latest revised DSM-V version released in May 2013, the subgroups known in DSM-IV/RT (Revised Text) have been brought together in a single category named ASD or Autistic Spectrum Disorder (this term replaces PDD), and the symptomatic triad thus becomes a dyad.

Manifestations of behavioural disorders

According to Nicoletta et al, (2015), behaviour disorders are manifested by an ability to perform repetitive movements such as motor or verbal stereotypes, or unusual sensory behaviours, excessive attachment to routines and ritualized patterns of behaviour, restricted fields of interest (does not seek to share interests with others) and fascination with certain objects, unusual reaction to sensory stimuli or unusual interest in sensory aspects of the environment, temper tantrums, aggressive gestures directed at self and/or others, absence of fears or irrational fears, insensitivity to pain, hyper- or hyposensitivity to light, sound, touch, certain textures, and conspicuous restlessness.

Epidemiology

The terms ASD and PDD are often used interchangeably, and their meanings are very similar. According to current best estimates, the prevalence of autism is around 20 to 30 cases per 10,000 individuals, while the prevalence of ASD as a whole is around 90 to 120 cases per 10,000 individuals. Male children are the most affected. These estimates are based on studies carried out in North America and Western Europe, but a recent review that included a more diverse representation of prevalence estimates worldwide presents similar figures (Newschaffer, 2007). It is more difficult to determine the prevalence of some specific ASDs found in the DSM-IV, including Asperger's Syndrome (AS) and Childhood Disintegrative Disorder (CDD), because these disorders are rarer (particularly in the case of CDD) or because they are not characterized by a clinical phenotype clearly distinct from the phenotype of other ASDs (particularly in the case of AS). (Fombonne, 2012).

Typology

The PDD categories identified in the International Classification of Diseases and Related Health Problems (ICD-10) are:

- **Infantile autism**, also known as early childhood psychosis, Kanner syndrome or autistic disorder, is characterized by abnormal or altered development, and manifests itself before the age of three, with three main symptoms: disturbed functioning in social interaction, communication and behaviour. In 70% of cases, autism is associated with mental retardation.
- **Atypical autism**: or atypical infantile psychosis, which differs from infantile autism in the sense that it occurs after the age of three. The most common features are profound mental retardation and language acquisition disorders.
- **Rett syndrome**: Affects only females after six to eighteen months of normal development. It is associated with cranial growth deceleration, loss of manual skills, stereotyped movements, loss of socialization, incoordination of walking or trunk movements, severely impaired language, and severe psychomotor retardation.
- **Another childhood disintegrative disorder**: development is normal up to around the age of two, but can last up to 10 years. The disorder generally begins around the age of three or four. Disintegration is rapid and spectacular.
- **Hyperactivity associated with mental retardation and stereotyped movements**: this is a major attention disorder with significant hyperactivity, severe intellectual retardation and stereotyped movements.
- **Asperger's syndrome**: described by Hans Asperger (1944) as autistic psychopathy, which differs from autism in the absence of language delay and cognitive impairment. Motor skills are affected, and stereotyped movements are present. These children are often described as "quirky". This disorder is often diagnosed much later than typical Kanner autism. There is no associated mental retardation in Asperger's syndrome.

Associated disorders

According to Jacques Constant, disorders associated with autism often include psychiatric pathologies (in 30% of cases), epilepsy (in 20 to 25% of cases), mental retardation (in 70 to 75% of cases), sleep disorders, eating disorders, Attention

Deficit Disorder with or without Hyperactivity (ADHD), sensory deficits, Tourette's syndrome, Rett's syndrome, Fragile X syndrome, Down's syndrome, Angelman's syndrome, tuberous sclerosis and more. It's important to remember that autism is a disability for which there is no cure, although there is a relatively high degree of attenuation (Carron, 2006).

Aetiology

Although the psychomotrician's work with autistic children does not focus on the causes of autism, it does seem important to us to understand the aetiology of these disorders in their multi-factorial dimensions. Today, almost all professionals agree that a multi-factorial aetiology must be considered. They do not claim to reflect all the research that has been published, but they do point to the interest in researching the aetiology of autism and the multi-factorial aspect of this disorder (Amar, 2004). The factors that explain the causes of this syndrome are:

- **Genetic factors:** several studies on monozygotic and dizygotic twins have looked for one or more genes responsible for autistic disorder. Monozygotic twins show a relatively high concordance with autistic syndrome, whereas in dizygotic twins the disorder is very minimal. There is no doubt that autism has a genetic origin, but today, researchers are unable to state clearly which gene(s) is/are responsible for autism (Amar, 2004).
- **Biochemical factors:** People with autistic syndrome have disturbances in their neurotransmitters. In fact, serotonin, dopamine, adrenalin, noradrenalin and beta endorphins are found at abnormally high levels in the blood of autistic individuals. Panksepp (1979) noted a similarity between certain autistic behaviours and those of opium addicts. His hypothesis is simple: the excess of cerebral beta endorphins is due to poor assimilation of certain foods, notably cereals and dairy products (Amar, 2004).
- **Neurological factors:** every region of the brain seems to be affected: the cerebellum, limbic system, cortical regions, corpus callosum and brain stem (Amar, 2004).
- **Cognitive factors:** people with autism have deficits in executive functions and central coherence (Amar, 2004). Birth factors, such as the age of the parents at the time of procreation, are considered risk factors above the age of 35 for the mother and 39 for the father. In the case of multiple pregnancies, additional attention is paid to the karyotype of the foetuses and their social behaviour in early childhood. Family history must be taken into account. The pre-existence of an autoimmune disease or ASD in the siblings is a risk factor (HAS, 2010).
- **Metabolic factors:** a disturbance in metabolic pathways has been demonstrated in some PDD subjects. This disorder can be observed in the synthesis of cholesterol, purines and creatine. There is also degradation of gamma-aminobutyric acid (GABA) and amino acids (phenylketonuria, and homocystinuria) (Schneider, 2014).
- **Hypothetical and unproven:** congenital rubella and the measles-mumps-rubella (MMR) vaccine have long been incriminated as a source of risk for the onset of PDD. This hypothesis was raised in the late 90s. This hypothesis of an association between autism and combined vaccination has not been confirmed (HAS, 2010). Indeed, the authors of the 2005 Cochrane review concluded that the association between autism and combined vaccination was unlikely (Demicheli et al, 2005) (Fombonne, 2010). Another hypothesis raised in the 1970s relied on the often-observed presence of celiac disease in PDD subjects. This is a chronic intestinal disease of

autoimmune origin. It is linked to food intolerance to gluten (wheat flour) and casein (dairy products). Since then, clinical studies have shown no link between autism and celiac disease (AFSSA, 2009), (HAS, 2010).

- **Erroneous factors:** for a long time, parents were held responsible for their child's autism. This erroneous theory blamed deficient or inadequate parenting and parental bonding (Schneider, 2014).

Support

There is no cure for PDD. However, certain classes of medication are useful for improving maladaptive behaviours that interfere with socialization. Depending on the biochemical and neurobiological aetiology of autism, various treatments are proposed. In March 2012, the French National Authority for Health (HAS) published a guide to good practice recommendations for the management of PDD. An early, multidisciplinary approach is an undeniable prerequisite for improving the symptoms that hamper the autistic person's social adaptation. A number of programs have been recognized as useful, and are applied in centres catering for these children:

- **The Applied Behavioural Analysis (ABA) model:** it aims to teach the child to identify desired and undesired behaviours, by repeating sequences with positive stimulation (reward, encouragement) or negative stimulation (ignorance or neutrality);
- **The Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH) program:** This psycho-educational program aims to improve learning and autonomy in terms of space and time. The aim is to encourage and facilitate the child's adaptation to the environment in which he or she finds him or herself, so that he or she can acquire functional skills (HAS, 2010);
- **Picture Exchange Communication System (PECS):** This program is based on a system for communicating with autistic children through the exchange of images;
- **Other psychosocial interventions:** these complement behavioural education programs. They call on the services of several professionals, notably in the fields of psychomotor therapy, speech therapy and psychotherapy. Support for autistic children must be multidisciplinary.

2.2. Psychomotricity

Definition

Psychomotricity is a concept in the human sciences. It is considered a body-mediated psychotherapy. It is based on the interrelation between motor functions and the psychic life of the individual, the body being an anchor point for sensorimotor, emotional and affective, cognitive and social experiences. It offers a global vision, placing the subject's bodily manifestations at the centre of his or her affective and psychic life. Psychomotor therapy helps to restore balance between motor functions and psychic life, enabling the subject to adapt more effectively. The treatments offered are in line with the 1988 decree on the competencies of psychomotricians: early education, psychomotor stimulation and stimulation, rehabilitation and treatment of psychomotor disorders (Marion, 2022).

Target populations

Psychomotricians can work with people of all ages (Marion, 2022):

- **Premature newborns:** Due to the trauma of premature birth and a sudden, too-early separation, mother-child and parent-child relationships are altered and disturbed. In order to support parental support, the psychomotrician can observe the newborn's skills and discover suitable stimuli to encourage exchange, communication and the discovery of the surrounding world within the relationship.
- **Young children:** The psychomotrician is qualified to treat delays or discrepancies in psychomotor acquisition and deficits in one or more motor skills. They can also work with patients with communication disorders, graphomotricity, hyperactivity, inhibition or concentration problems.
- **Adolescents:** Psychomotricity enables us to address relational problems that adolescents may encounter with themselves, their families and their social environment.
- **Adults and the elderly:** The psychomotrician also has skills in the fields of memory (Alzheimer's plan), balance (falls prevention), stress (relaxation), body schema and body image (psychiatric disorders such as schizophrenia), space and time (spatio-temporal disorientation of the demented subject). The care of multi-handicapped or palliative patients is also developing.

Psychomotricity care

The first contact with the patient and his or her family is to carry out a psychomotor assessment (interview, tests and trials) with a view to drawing up the therapeutic project. This assessment must be prescribed by a doctor, but sometimes families come simply on the advice of a teacher, friends or on their own initiative. Then, if necessary, based on the conclusions of the assessment, and after discussion with the multidisciplinary team, a treatment plan is put in place, with one or more mediations adapted to each situation, pathology and individual. There are as many types of treatment as there are subjects. Mediations can be relaxation, sensory-motor touch, music, drawing, games, water, sport, etc. They depend on the subject, the psychomotorist and the therapist. They depend on the subject, the psychomotrician and the objectives that have been set (Marion, 2022). Psychomotricians usually work as part of a multidisciplinary team. They may work alone, in private practice, or within an institution (school, paediatrics, neonatology, educational home, home for dependent elderly people, etc.) (Marion, 2022).

2.3. Parental guidance

Definition and significance

Stewart (1986) defines parental guidance for parents of handicapped children as the helping relationship between specialists with in-depth knowledge and the parents of handicapped children, seeking to better understand the unique concerns, problems and feelings of these handicapped children. He also adds that guidance is a learning process focusing on self-improvement in order to solve the problems and concerns of autistic children. It is also a process in which parents are helped to become complete and perfect performers who help their child and give great value to the balanced family (Stewart, 1986). Parents of autistic children are interested in parental guidance to overcome the problems and difficulties, summarized by Cohen and Donnellan in the following: dealing with a child who cannot transmit or interpret his needs and desires to others (Stewart, 1986).

Professionals working with parents

Admittedly, it can be difficult to work with parents when their demands seem excessive, and when they expect professionals to help their child progress, sometimes overlooking the limits inherent in their disability. Faced with such problematic situations, the role of parents can be insidiously, but sometimes more directly, called into question. A true collaborative approach requires acceptance beyond the initial difficulties. When a parent's impatient demands meet the empathy, understanding and competence of a knowledgeable professional, together they find a middle way in which the parent's expectation is respected but inflected according to certain realities and positively transformed for the benefit of the person with autism. (Mokrane, 2013).

The family's role in caring for children with autism

In the early 1960s, autistic children were thought to have suffered from emotional deficiency from an early age. Their lack of sociability, poor communication skills and strange behaviour were thought to be reactionary to a hostile, anxiety-provoking family environment. Unambiguous research shows that these assumptions were both incomplete and false. This research data has enabled us to develop a totally different approach to the care of these children and their parents. It is now possible to build a psycho-educational project in which parents will have their place as partners. Parents are taught special educational methods based on the needs of each child in his or her own family context (Calligora Sonia, 2002), (Mokrane, 2013).

Benefits of parent training

According to Mokrane (2013), the benefits of training parents of children with autism are manifold. It creates a partnership between parents and other caregivers, helps parents gain empirical knowledge of their child's skills and impairments, involves parents in choosing the behaviours we seek to modify, offers the possibility of increasing the number of hours of treatment, allows progress to be maintained and generalized, can be used to teach other skills, may be more effective at home and in the community, gives parents a sense of control and effectiveness, thus reducing their stress, can improve the interaction and relationship between parent and child, and can prevent the development of more serious behavioural problems.

3. Methodology

3.1 Type of study

A descriptive cross-sectional study was carried out in a Centre de Prise En Charge d'Enfants à Besoins Spécifiques in the city of Yaoundé, Cameroon.

3.2. Study population

The study population consisted of parents of children with suspected ASD who came for consultation to the Centre de prise en charge during the study period. Parents who agreed to take part in the study were recruited according to the following criteria:

- Parents who completed the first part of the questionnaire assessing their knowledge of autism may or may not have had children with autism;
- However, to complete the second part of the questionnaire, it was necessary to have an autistic child, as this part concerned the evaluation of the family's involvement in the child's care;
- The children selected for treatment were children diagnosed with autism, aged between 3 and 10, with behavioural problems, regardless of gender.

A consent form for participation was signed by the child's legal representative. Two patients (one girl and one boy) with ASD were selected.

3.3. Work procedure

Assessing parents' knowledge of ASD

Parents' knowledge was assessed using a pre-tested questionnaire, validated during a face-to-face interview. Questions covered the definition of autism, its warning signs, cure, treatment and management.

Assessing family involvement in care

The family's involvement in the child's care was assessed using a pre-tested questionnaire validated during a face-to-face interview. The questions concerned the child's diagnosis, the child's care, the child's autism warning signs, the severity of the child's autism, the child's diet, the parent's participation in autism training or seminars, and the child's regular attendance at sessions, working with the child at home, observing improvements in the child, exchanging experiences with other parents of autistic children, the parent's compliance with the therapist's instructions, the main difficulties the parent encounters with the child, the parent's opinion on parental guidance with home follow-up.

Determining the degree of autism

The patients' degree of autism was determined using the Childhood Autism Rating Scale (CARS), which comprises 15 behavioural items. Each item comprises 4 propositions, and the parent ticks one proposition according to his or her child. Each proposition is rated, and the score is tallied at the end.

This tool was used to assess the degree of autism according to the following norms:

- Subjects with a score below 30 are considered non-autistic;
- Subjects with a score greater than or equal to 30 are declared autistic;
 - Scores ranging from 30 to 36.5 correspond to mild to moderate autism;
 - Scores ranging from 37 to 60 correspond to severe autism.

Psychomotor assessment

The psychomotor assessment is a specific evaluation tool for psychomotricians. It enables the psychomotrician to highlight a subject's skills and difficulties at a precise moment in time. It uses standardized tests and combines them with clinical observations. It is carried out before and after treatment. The results of the assessment are used to highlight the child's aptitudes and weaknesses, to draw up a specific program of work for the child, and to justify the areas of care chosen when drawing up the program of work. The assessment is carried out in the following stages:

- **The interview with the parents:** to find out about the child's early psychomotor development, how the family functions and the impact of the disorder on daily life, with a view to drawing up a case history.
- **Psychomotor evaluation:** an interview with the patient to gain a better understanding of his or her functioning and assess all psychomotor functions. It took place over several sessions and included tonus tests (ballant, extensibility, push test, etc.), the M-ABC, an international reference test for the evaluation of motor development disorders or delays (Soppelsa and Albaret, 2005), and the bell barrage test to assess attention. Next, clinical observation was used to identify maladaptive behaviours (Dorsaz, 2017) such as hyper/hypo sensitivities to light, sound, touch and certain textures, hyperactivity or inhibition, tantrums, aggressive gestures directed at self and/or others, stereotypies, fascination with certain objects, absence of irrational fears or apprehensions, insensitivity to pain, excessive dependence on routines. Indirect observations were made by the therapist to establish a profile of the child's behaviour, based on the information provided by the family.

3.4. Data analysis

The data collected from the questionnaire were encoded and analysed using Microsoft Excel_2016. The data obtained from the various psychomotor assessment tests were interpreted. Frequency measures were determined for qualitative variables, and measures of central tendency and dispersion for quantitative variables.

4. Results

4.1 Assessing parents' knowledge of ASD

Demographic characteristics

For the study, a target of 32 people received in consultation was expected, but 26 people agreed to take part in the study and were surveyed, for a participation rate of 81.25%. The median age of the participants was 32, ranging from 22 to 50. Of the 26 people surveyed, 12 were male, for a M/F sex ratio of approximately 1:1.

Parents' level of knowledge about ASD

Parents' knowledge of the definition of autism is shown in the figure below:

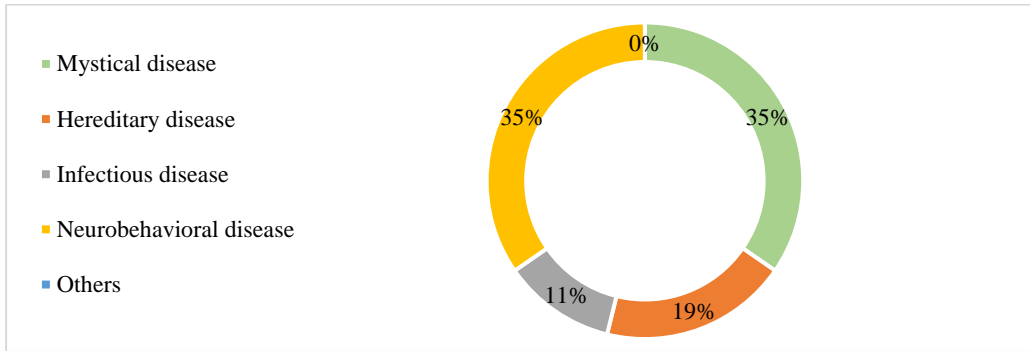


Figure 1. Parents' level of knowledge about the definition of autism

It emerges from the definition of autism that 9 (35%) parents think it's a mystical illness, 5 (9%) think it's hereditary and 3 (11%) think it's infectious. Nevertheless, 9 (35%) parents think it's a neurodevelopmental disease that affects interaction with others, communication and behavior.

Of the 26 parents surveyed, 6 (24%) had at least one other child or close acquaintance with autism.

Warning signs of autism

Parents' knowledge of the warning signs of autism is shown in the figure below:

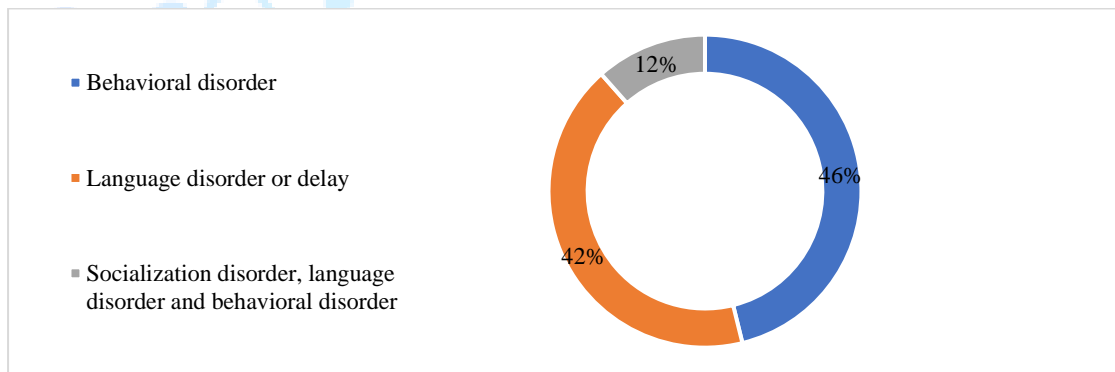


Figure 2. Parents' knowledge of autism warning signs

An analysis of parents' knowledge of the warning signs of autism shows that almost all parents know at least one warning sign of autism. Of the 26 parents questioned, only 3 (12%) knew that behavioral disorders, language disorders and socialization disorders were among them. On the other hand, 23 (88%) parents think it's only behavioural disorders or language disorders, with 12 (46%) parents for behavioural disorders and 11 (42%) parents for language disorders.

Managing autism

Parents' knowledge of autism care is shown in the table below:

Table 1. Parents' knowledge of autism care

Variables	Workforce	Percentage (%)
Knowledge of an establishment specializing in the care of autism		
Yes	15	57.7
No	11	42.3
Knowledge of specialists for the care of autism		
Medical doctor	7	26.9
Paramedical health care workers	13	50.0
No idea	6	23.1
Existence of drug treatment for autism		
Yes	6	23.1
No	20	76.9
Existence of traditional treatment for autism		
Yes	10	38.5
No	16	61.5
Possibility of a permanent cure of autism		
Yes	7	26.9
No	19	73.1

Concerning parents' knowledge of autism care, 15 (57.9%) parents were aware of specialized autism care facilities.

As for autism care staff, 7 (26.9%) parents think it is done by doctors, 13 (50.0%) parents think it is done by paramedical staff and 6 (23.1%) parents have no idea about care staff.

Of the 26 parents surveyed, 6 (23.1%) thought there was a drug treatment to cure autism and 10 (38.5%) parents thought there was a traditional treatment to cure autism. Also, 7 (26.9%) parents think it is possible to cure autism for good.

4.2 Assessing parental involvement in care

Of the 6 autistic children on whom we evaluated parental involvement in their care, 5 (83.3%) were boys. All had been diagnosed with autism between the ages of 3 and 5 by a doctor (neuropsychiatrist). For three of the parents of these 6 children, their child's diagnosis was their first contact with ASD. As for the duration of diagnosis, 3 (50.0%) were diagnosed between the ages of one and three. The warning signs for the 6 parents were behavioural disorders, communication disorders and socialization disorders. In all, 4 (66.7%) of the children had mild autism and 2 (33.3%) had

moderate autism according to their diaries. Of the 6 parents, 4 (66.7%) were aware that certain foods were good for their autistic child, while 3 (50.0%) were aware that certain foods were bad for their child. None of these parents put their child on a diet. All 6 parents started to take care of their child less than a year after diagnosis. None of the parents surveyed had been required to attend or participate in any autism related seminars or training courses, and 3 (50.0%) parents were regular attendees at treatment sessions with the therapist. The main reason for parents' irregularity was unavailability or lack of time. Only 4 (66.7%) parents regularly worked with their child at home, and in less than an hour's time (between 15 and 45 minutes' maximum). Even if it's slow, they see improvements in their child thanks to this work. None of the 6 parents talk to other parents of autistic children about their child's condition. Only 4 (66.7%) parents find it important to work with their child themselves, but all only sometimes follow the therapist's instructions, and just 1 (16.7%) parent fails to remain firm with the child when working with him or her. All the parents' main complaints were about behavioural problems, communication difficulties and respect for authority. Only one parent had ever been assisted at home to work with their child.

Parents' perceptions of parental guidance are shown in the figure below:

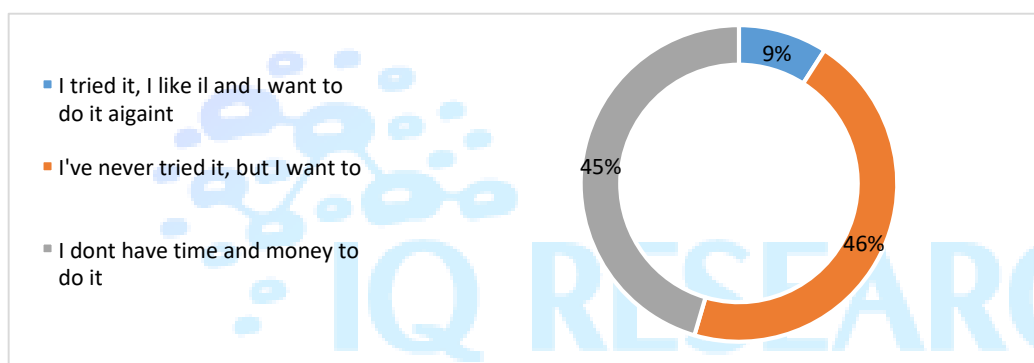


Figure 3. Parents' perceptions of parental guidance

Concerning parents' perceptions of parental guidance, 11 parents were interviewed, of whom only 1 (9.0%) had already tried it, liked it and wanted to try it again, 5 (45.5%) parents had never tried it and 5 (45.5%) parents said they didn't have the time or means to do it.

4.3. Patients' degree of autism

Each patient in the study had a CARS score above 30, which is the threshold value defining them as autistic. Patient "X" had a CARS-T score of 33.5, corresponding to the average degree of autism, and patient "Y" had a CARS-T score of 34.5, corresponding to the average degree of autism.

4.4. Initial psychomotor assessments

Case 1: Child "X"

➤ **Presentation and history**

Case "X" is a 10-year-old girl born on June 11, 2012. She is the first of three siblings and has been potty-trained since she was five. She doesn't like to sleep alone on the bed, but sleeps well. She eats by herself without difficulty and cleanly. "X" doesn't like fruit, eats almost everything, but prefers traditional dishes. She has no medical history.

➤ **Psychomotor evaluation**

General behaviour: Generally speaking, "X" is a calm, smiling, jovial little girl. She accepts proximity and physical contact but refuses eye contact. She has an unsteady gaze but good visual control over her movements. She is attentive and enthusiastic. Her behavioral disorders include unusual sensory behaviours involving smell, taste, hearing and touch. Violent reactions with agitation and shouting towards herself and others are also observed.

Tone: With regard to basic tone, there is hypotonia in the upper and lower limbs on the right side. In terms of action tone, the arm drop was a failure, as she blocked her hands during the movement. Postural tone assessment showed that during the push-up test, she uses her right foot as a support foot and maintains her balance without difficulty.

Coordination: She has a general dynamic coordination determined by the Soubiran method. When walking, both arms are balanced and there is no imbalance. She starts walking with the right foot, supported by the entire sole of the foot. When jumping, "X" fidgets, smiles and makes faces, but is unable to jump. When running, she drags her left foot, alternating the step. She can't follow a straight line, but stops when asked. This shows that she has good inhibition of movement. When we assessed static and dynamic balance, we found that "X" was only able to stand on one leg for six seconds (the right leg). In the immobility test, she stands with her feet together, does not close her eyes, and can only hold on for about fifteen seconds.

For fine coordination, we can see that in the MABC-2 aim-and-catch test, "X" manages to make three correct throws out of ten and to catch seven out of ten. She puts the coins in the box with both hands without difficulty (six coins in 17 seconds with the right hand and fifteen seconds with the left). She threads and removes more than a dozen beads on a rod, the gesture precise and fast. She pinches and colours in a format, just slightly crossing the outline of the design. We can thus conclude that she has good bi-manual coordination. The Kwint test and the pianotage test are failures.

Body image, body schema and laterality: Somatognosy is not appropriate for "X", as she does not speak. On the other hand, she successfully completes the man reconstruction test, which shows that she knows the different parts of her body. During the mirror test, "X" only holds her gaze for a maximum of two seconds, then becomes distracted and turns her back to the mirror. "X" is already laterally assertive and homogeneous on the right.

Space, time and rhythm: Knowledge of left/right and general orientation cues (front/back, up/down) has not been acquired. Nevertheless, good visio-spatial and visio-constructive abilities were noted in the M-ABC2 bicycle path test. In

Mr. Stambak's rhythmic reproduction test, "X" is unable to reproduce any rhythm. The spontaneous tempo is slow and irregular.

Cognitive function and attention: She can make object/object and image/image associations. She is able to sort objects according to size and colour. In the case of visual attention, she shows an interest in the task and in the person present. In the bell barrage test, she failed to cross out any bells in one minute. In terms of hearing, she responds to her name and has good hearing. She takes others into consideration and respects each other's role and turn in a game.

Sensoriality, interaction/Communication: No self-injurious behaviour is observed, although she is sometimes violent. But she is hypersensitive and avoids touch. "X" "Takes-Watches-Tends", she says neither "Yes" nor "No". She can express a choice in the presence of an object. The only word she utters is papa.

Socialization: She doesn't engage in interaction, but pays attention to others. She accepts proximity but is reluctant to be touched and cuddled. She does not play with other children apart from her brothers and close circle. When she wants to make herself comfortable, she fidgets and stomps her feet on the floor while lifting up her dress, or she heads straight for the toilet. When she wants to do something and can't, she holds the adult's hand and leads her towards what she wants.

Graphism: Using G. Soubiran's graphomotor assessment, we note that the position of the sheet of paper remains upright in relation to the table and positioned in the hemi-field of the writing limb (to the right). The writing tool is held on the right with a tri-digital grip. General tone is well regulated. The wrist is supple, but the gesture is somewhat rigid. The upper body is straight in relation to the table, with the forearm resting on the table. The second-hand rests on the table and is used to hold and move the sheet of paper. She sits at the back of the chair, her lower limbs swinging. Tonic diffusions of the synkinesis type are observed during the graphical movement in the face. Script automatism is not operative. Tracings are not mastered. She manages to write the vowels "a, o" and the vowel "i" is in the process of being acquired. The colouring process is well under way and control of the gesture has been fine-tuned. There is little overtaking, but the surface to be coloured is not well covered.

Conclusion and therapeutic plan: Overall, "X" displays good bi-manual and visiomotor coordination and attention. However, he has social interaction problems, behavioural problems, static and dynamic balance problems, body image problems, no mastery of spatio-temporal concepts, and delayed graphomotor acquisition. Psychomotor treatment is therefore necessary. Parental guidance will be provided at home. Three sessions of forty-five minutes to an hour each will be held per week in a supportive environment. The parent(s) will be expected to take part in the sessions, helping the child with his homework, encouraging and motivating him to make ever greater efforts.

Case 2: Child "Y"

➤ Presentation and history

Case "Y" is a 6-year-old boy, one of two siblings. The pregnancy was normal, but the delivery was episiotomic. He has no sleep disorders. He learned to walk at 9 months. In terms of language, he babbled, then said mummy and daddy unaddressed at around one year, then became mute. Potty training was acquired at around three years. As for eating,

he sorts his meals. His medical history includes convulsions at the age of two and a hearing test for auditory potential hearing loss (APE), followed by hearing aids.

➤ **Psychomotor evaluation**

General behaviour: Generally speaking, "Y" is a temperamental, agitated boy who becomes violent in the face of frustration and rejection. He accepts physical contact and closeness, but not eye contact. His eyes are unstable, but he has good visual control over his movements. He explores his space and toys well, displays stereotypies and has a strong zest for life. He performs certain tests with ease. Y's behavioural problems include stereotypies and unusual sensory behaviours, hyperactivity, not seeking to share his interests with others, strong attachment to routines and difficulty changing or stopping an activity he likes or does. He has temper tantrums and aggressive gestures against himself and others.

Tone: The left side is more swaying than the right. Background tone is on the same tonic side in the axial plane. Postural tone examination was satisfactory,

General dynamic coordination: He can jump, but cannot do so on the spot with feet together or eyes closed. When he walks, both arms are balanced and there is no imbalance. "Y" starts walking with his right foot, supported by the entire sole of his foot. When running, he alternates steps. He is unable to follow a straight direction, but he stops when asked, which shows that he has good inhibition of movement. He is unable to stay on his feet or hop.

For fine coordination, he catches and throws the ball. Shoots the ball at a target, threads and removes beads on a rod, puts coins in a box. He cuts with scissors, screws and unscrews. He colours in a format but goes beyond the outlines of shapes. He has good visual support for gesture and good tonal control, but the coordination between the two is not good.

Body image, body schema and laterality: In front of the mirror, he doesn't fix his image and looks away, which could reflect an immature body schema. He fails the man reconstruction test, which shows that he has no control over his body parts. The development of body schema and body image are not adequate for his age. "Y" is already laterally assertive and homogeneous on the right.

Space, time and rhythm: Chronological and temporal reference points are not known (yesterday, today, tomorrow, morning, evening, etc.). Spatial notions have not been mastered (below, above, left, right, in front, behind, etc.). Overall, "Y"'s topological, spatial-temporal and visio-spatial knowledge is fragile and inadequate.

Cognitive function and attention: Doesn't always follow the rules of a game. He does simple puzzles, constructions and embedding. He makes simple associations and sorts; he understands and carries out simple instructions. Shows interest in the task and the person present. He reacts to hearing his first name and has good hearing. He does not always take others into consideration, and is unable to role-play.

Interaction and communication: He shows, takes and holds an object presented to him. Expresses himself through reactions or gestures when he wants or doesn't want something. Expresses choice in presence or absence of object. Becomes violent in the face of change.

Graphics: The leaf is straight in relation to the table. Grip varies between tridigital and palmar. Digital untying is not yet observable, but general tone is well regulated. The wrist is supple but somewhat rigid. The body is upright in relation to the table. The left hand is left alongside the body, the lower limbs are static and the seat is at the back of the chair. Script automatism is not operative. Tracing has not been mastered or acquired. Colouring is not well developed, and gesture control needs fine-tuning. "Y" has a delay in graphic acquisition, and motor control is underdeveloped, making it difficult to learn to write.

Conclusion and treatment plan: This assessment shows that child "Y" has sufficiently developed general psychomotor skills. On the other hand, we note the presence of several behavioural disorders, inadequate spatial-temporal skills and a delay in graphic acquisition. Parental guidance will be provided at home. Three sessions of forty-five minutes to an hour each will be held per week in a contained setting. The parent(s) will be expected to take part in the sessions, helping the child with his homework, encouraging and motivating him to make ever greater efforts.

4.5. Monitoring progress over 12 weeks of care with parental guidance

Case 1: child "X"

The results of the 12-week follow-up of case "X" with parental guidance are presented in the table below:

Table 2. Evolution of case "X" over 12 weeks of care with parental guidance

Initial assessment: therapeutic project	Evolution: 3 weeks	Evolution: 6 weeks	Evolution: 9 weeks	Final report: 12 weeks
Short-term: - Graphomotricity - Sensitivity disorder	- Improved writing of "a" and "o" - "i" being acquired - Introduction of vowels "e" and "u" and numbers 0, 1, 2 and 3 - Medium touch tolerance.	- Acquisition of digits 1 and 2 - Number 3 is currently being acquired. - The vowels "e" and "u" are being acquired. - "i" being acquired. - Medium touch tolerance.	- Medium touch tolerance. - Slight decline in acquisitions.	- Better touch tolerance - Acquisition of vowels "a, o, i and e" and numbers 0, 1, 2 - The number 3 and "u" are being acquired.
Comments	Script automatism is developing well, but she has great difficulty writing the "i", her strokes are stiff and "X" makes the dots look like sticks.	Homework left with parents for their children is not always done on time. Sometimes it's not even done, which slows the child's progress and creates periods of stagnation.	Unavailability of the parent to monitor the child and work with her on a regular basis, leading to slight regression.	The parents began to follow the child better, to do her homework and to work with her more, which led to clear improvements in her performance.

<p>Medium-term:</p> <ul style="list-style-type: none"> - Graphomotricity - Behavioural disorders 	<ul style="list-style-type: none"> - Ongoing acquisition of the number 3 and the vowels "u" and "i" - Learns to deal with tantrums that lead to violence (towards self and others) - Refusal to eat fruit 	<ul style="list-style-type: none"> - Ongoing acquisition of the number 3 and the vowels "u" and "i" - She already agrees to put the fruit on her tongue, even if she spits it out immediately. - When her mealtimes are respected, she is rather calm. 	<ul style="list-style-type: none"> - Ongoing acquisition of the number 3 and the vowels "u" and "i". - She again refuses to put the fruit in her mouth, not even on her tongue. - In the case of seizures for which there is no obvious reason, we can't really prevent them, just manage them by using a number of procedures to limit their intensity. 	<p>Ongoing acquisition of the number 3 and the vowels "u" and "i".</p> <p>Watching what you eat can considerably reduce your tantrums, as this is the main cause of them.</p>
<p>Comments</p>	<p>Although tantrums sometimes occur for no obvious reason, they are usually caused by the desire to eat or frustration at being told "NO".</p>	<p>If she doesn't like the meal or doesn't eat when it's over, it can lead to tantrums.</p>	<p>The instructions given to parents about eating the fruit are not respected, so she has regressed in this area, hence her refusal once again.</p>	<p>She has a lot of trouble writing the vowel "i", but shows a lot of willpower. Despite our insistence, she now categorically refuses to taste any fruit, even if she does consume fruit juice.</p>
<p>Long-term:</p> <ul style="list-style-type: none"> - Acquisition of spatial and temporal concepts - Body image - Behavioural disorders 	<p>No notion of space or time is known.</p>	<p>Her self-confidence grows as she acquires new knowledge. The number "3" is acquired. The vowel "u" is written with guidance. The vowel "i" is acquired, even if it's not written very well.</p>	<p>Its organization and use of space have improved significantly.</p>	<p>The increase in her skills gives her greater self-confidence. By understanding what triggers these attacks, parents and children can limit and better manage them.</p>

Comments	The difficulty in respecting his mother's authority also stems from the fact that she	She takes better advantage of her space		Involving parents helps them to communicate and understand their
	gives in easily to his whims.			child better, which in turn improves "X's" behaviour.

Case 2: child "Y"

The results of the 12-week follow-up of case "Y" with parental guidance are presented in the table below:

Table 3. Evolution of case "X" over 12 weeks of care with parental guidance

Initial assessment: therapeutic project	Evolution: 3 weeks	Evolution: 6 weeks	Evolution: 9 weeks	Final report: 12 weeks
In the short and medium term: - Graphomotricity - Space - Behavioural disorders	- Learning to write the vowel "a" - We can't really see any change in behavioural problems. - He is restless and unfocused.	- Introduction of digits 0, 1 and 2. - Acquisition of the vowel "a" but disproportionate writing. - He's less and less agitated and concentrates better on what he's doing when he wants to.	- It writes "a" proportionally and respects the limits given to it on a format. - He stays focused on what he's doing and anticipates activities.	- The vowel "a" has been acquired, but writing the digits 0, 1 and 2 requires guidance. - "Y" is less agitated and has better concentration. - He's aware of the limits of his space and invests it better.
Comments	- The parents are committed to the work. - Scripting automatism is not acquired.	These improvements have encouraged parents to become even more involved in their child's follow-up.	A calm, unstimulating environment is needed to maintain attention and concentration.	We observed a regression in "Y" at one point, as the parents were not always available to follow them.
Long-term: - Body schema - Body image	Disorders such as self and self-mutilation is still very present.	- We observe an attenuation in heteromutilation.	Period of stagnation.	- Body schema and body image remain immature for his age.

- behavioural disorders		- He cannot identify his body parts when asked. - He is less and less agitated.		- Tantrums are less frequent but still present.
Comments		When he's prevented from using violence on others, he uses it on himself or breaks things.	Tantrums occur mainly in the face of frustration and rejection, because he's rather temperamental.	"Y" and his parents are involved in the overall care, which is encouraging. It also helps "Y" to make progress, even if it takes time.

5. Discussions

The results showed that most parents have insufficient knowledge about autism, because although some parents (35%) know what autism is, the majority (65%) confuse this disability with an infectious or even mystical disease. And even if all parents surveyed (100%) know at least one of the warning signs of autism, some parents (23%) are completely unaware of whom to consult for a case of autism. This raises a real problem of awareness of autism, a disorder with a prevalence of 90 to 120 cases per 10,000 individuals (Fombonne, 2012). The fact that 65% of parents surveyed confuse the definition of autism with other notions shows that they cannot become meaningfully involved in their child's care if they are not at least accompanied by a specialist. What's more, their lack of knowledge about which professional to consult, and which treatment structures to use, further underlines the limits of their involvement.

Of the parents with autistic children surveyed, all of them (100%) listed behavioural problems as their main complaint, but 50% were irregular at their sessions. Only 4 of the 6 parents sometimes work with their child at home, and only for short periods, without really following the therapist's instructions. This could explain the sometimes very slow output of the therapist's work, as there is a lack of continuity, which could reflect discouragement on the part of the parent and consequently a drop in their involvement in their child's care. Among parents with autistic children, 33% did not put their child on a diet, 33% didn't even know it was possible to have one, and 33% didn't think it was important to follow their child's progress, once again reflecting their low involvement in their child's care. Almost all parents with an autistic child (91%) have never experienced care with parental guidance and follow-up at home. Ignoring the child's behavioural problems, threatening or forbidding him or her are not the solutions. Being aware of what the child knows or doesn't know how to do, it's important to focus on the child's skills, as these influence the child's behavioural problems. Similarly, inadequate or poor communication will lead to the aggravation or installation of behavioural problems. Activities that the child enjoys should be given priority, with rewards and the introduction of instructions as the child progresses. The child should be available for learning, and find it interesting. You need to go gradually, and give the child time to integrate what you're doing. Reinforcers can be used: an object to which the child is very attached,

or words of encouragement. Nevertheless, the reinforcer should not be available or offered at all times, it should be used just as a reward after a great effort by the child (Dorsaz, 2017).

In view of the results obtained, it is clear that the effective involvement of parents in the psychomotor management of their child's behavioural problems had a positive effect on them. The study of cases "X" and "Y" showed that parental guidance with home follow-up was effective in improving their behaviour and their relationship with their parents. This translates into an increase in their skills, which has a direct impact on their behavioural disorder, a reduction in the occurrence of their tantrums and, above all, a better understanding of the children by their parents. These results corroborate those of Mokrane F., who worked on the effect of parental guidance on the improvement of autistic symptoms in children in Algeria. The main aim of the therapy carried out was to develop the child's skills and advise parents on behaviour management and reinforcement (Mokrane, 2013).

In a recent study (published June 16, 2022), an international research consortium has discovered how the action of a neurotransmitter in the cerebellum, dopamine, modulates social behaviour via an action on specific dopamine receptors called D2Rs. Using different genetic tools, the researchers show that changes in D2R levels, in a specific type of cerebellum cell, modify sociability and preference for social novelty, without affecting motor functions. These results provide a better understanding of sociability-related psychiatric disorders. Dopamine is the key neurotransmitter in the brain's reward system, involved in the control of motivation, emotional states and social interactions. The regulation of these processes relies heavily on the activation of neural circuits embedded in limbic regions. However, recent evidence indicates that the cerebellum, a region classically associated with motor control, may also contribute to higher cognitive functions, including social behaviours. This research provides insight into how dopamine enhances skills and improves behaviour in autistic children following care (Emmanuel, 2022).

6. Conclusion

This study highlighted two main problems: parents' poor knowledge of autism and a lack of significant parental involvement in the care of their autistic child. Today, the development of new, easily accessible methods enables parents to participate in the care of their autistic child. The results obtained have enabled us to conclude that the effective involvement of parents in the psychomotor management of their child's behavioural problems has had a positive effect on them. Parental guidance is important in the care of autistic children, and the information given to parents helps to create a favourable relationship between them and their children. A clinical interview with the parents provided further information on their understanding of autism, their involvement in their child's care and, at the end of the therapy, on the effect of the parental guidance with home follow-up experienced with them. To avoid marginalizing, stigmatizing or abandoning this segment of the disabled population, we suggest frequent awareness-raising campaigns on this disability, ongoing psychological support for affected families, popularization of the concept of parental guidance in care, and the creation of appropriate care centres in areas lacking them.

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