

The Importance of Using Sensory Profiling in Autistic Children in the Educational Environment

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Abstract

Autism Spectrum Disorder (ASD) is a condition characterized by alterations during neurodevelopment, which, depending on the degree of support that the person requires it is classified in three levels of severity. People with this condition (ASD) used to have sensory integration issues. The sensory integration, according to PhD Jean A. Ayres, is a neurological process that regulates the way in which a person processes the sensory information that is manifested in their learning and behavior. It is important to note that difficulties of sensory processing can be reflected in one or more senses, such as hearing, sight, touch, taste, smell, proprioception, or vestibular. In order to determine whether the origin of the disruptive behavior is due to an alteration in the sensory process, there is an assessment tool called Sensory Profile, which consists of observation and a series of questionnaires that determine which define what sensory system is compromised to explain how the sensory process can benefit the child's participation in daily activities, or conversely, hinder it, that may lead to implement an intervention program that help to develop strategies for parents, caregivers, therapists, or teachers to benefit the child's sensory integration process properly.

Key-words: Autism Spectrum Disorder, sensory integration, sensory profile.

Resumen

La Importancia De Hacer Uso De Perfil Sensorial En Niños Autistas Dentro Del Entorno Educativo

El Trastorno del Espectro Autista (TEA) es una condición que se caracteriza por alteraciones en el neurodesarrollo, la cual, dependiendo del grado de apoyo que requiera la persona, se clasifica en tres niveles de severidad. Las personas con TEA suelen tener problemas de integración sensorial. La integración sensorial, según la Dra. Jean A. Ayres, es el proceso neurológico que regula la manera a través de la cual una persona procesa la información sensorial, lo cual se ve reflejado en su comportamiento y aprendizaje. Es importante mencionar que las dificultades del procesamiento sensorial pueden verse reflejadas en uno o más sentidos como son oído, vista, tacto, gusto, olfato, propiocepción o vestibular. Para poder saber si el origen de las conductas disruptivas se debe a una alteración en el procesamiento sensorial, existe una herramienta de evaluación llamada perfil sensorial, la cual consta observación y de una serie de cuestionarios que determinan qué sistema sensorial se ve comprometido, para así explicar cómo el procesamiento sensorial puede favorecer la participación del niño en las actividades diarias, o por el contrario dificultarla y establecer un programa de intervención que ayude a generar estrategias a los padres, cuidadores, terapeutas o docentes, para favorecer el proceso de integración sensorial del niño de manera adecuada..

Palabras clave: Trastorno del Espectro Autista, integración sensorial, perfil sensorial.

A Importância de Utilizar o Perfil Sensorial em Crianças Autistas no Ambiente Educativo

O Transtorno do Espectro Autista (TEA) é uma condição caracterizada por alterações no neurodesenvolvimento, que, dependendo do grau de apoio necessário para a pessoa, é classificada em três níveis de gravidade. Pessoas com TEA costumam ter problemas de integração sensorial. A integração sensorial, segundo a Dra. Jean A. Ayres, é o processo neurológico que regula a maneira como uma pessoa processa a informação sensorial, o que se reflete em seu comportamento e aprendizado. É importante mencionar que as dificuldades no processamento sensorial podem afetar um ou mais sentidos, como audição, visão, tato, paladar, olfato, propriocepção ou sistema vestibular. Para determinar se a origem de comportamentos disruptivos está relacionada a uma alteração no processamento sensorial, existe uma ferramenta de avaliação chamada perfil sensorial, que consiste na observação e numa série de questionários que identifica qual sistema sensorial está comprometido. Dessa forma, é possível entender como o processamento sensorial pode facilitar a participação da criança nas atividades diárias ou, ao contrário, dificultá-la. A partir disso, pode-se estabelecer um programa de intervenção que ajude a criar estratégias para pais, cuidadores, terapeutas e professores, favorecendo o processo de integração sensorial da criança de maneira adequada.

Palavras-chave: Transtorno do Espectro Autista, integração sensorial, perfil sensorial.

INTRODUCTION

Autism Spectrum Disorder (ASD) is a neuropsychiatric condition characterized by alterations in neurodevelopment, where the behavior, communication, and social areas are affected. It is also characterized by avoidance of eye contact, repetitive movements, limited interests, and inability to recognize and/or express emotions, among other indicators.¹

Some of the tools used by clinical professionals for the diagnosis of autism are record sheets that serve to detect and quantify the behaviors presented by the person undergoing diagnostic evaluation, as well as the use of evaluation tools such as¹:

Clinical professionals use a variety of assessment tools for the diagnosis of autism spectrum disorder (ASD). Among these are record sheets designed to systematically identify and quantify behavioral manifestations exhibited by individuals undergoing diagnostic evaluation and evaluation tools such as¹:

- **ADOS** (*Autism Diagnostic Observation Schedule*)
- **ADI-R** (*Autism Diagnostic Interview-Revised*)
- **CARS** (*Childhood Autism Rating Scale*)
- **GARS** (*Gilliam Autism Rating Scale*)

Once the structured interviews, observation records, testing, and other complementary elements have been conducted, if the person is diagnosed with ASD, it is important to know the level of support they require².

When evaluating Autism Spectrum Disorder (ASD) as a communicative and social disability (classification of disability²), the level of severity, or more accurately, the **level of support** needed by an individual with ASD, is categorized into three levels according to the **DSM** (Diagnostic and Statistical Manual of Mental Disorders), fifth edition. These levels are as follows:

- Severity level 1: The individual requires support.
- Severity level 2: The individual requires substantial support.
- Severity level 3: The individual requires very substantial support.

In the educational setting, it is important to know the level(s) of support that a person with ASD experiences, and whether or not there are various reasons why their development and progress within a school may be hindered. This is because they may present sensory integration problems, where senses such as hearing, touch, proprioception, and other senses may present alterations³⁴⁵, generating significant challenges in school integration.

OBJECTIVE

To offer a comprehensive look at the importance of using sensory profiling in educational contexts, using a descriptive and documentary approach that seeks to raise awareness of the current situation, identify legal and methodological limitations, and open up avenues for future discussion in the fields of educational inclusion and telemedicine.

METHODOLOGY

To develop this article, a literature search was conducted to explore the use of the sensory profile in autistic children in the educational context. The search in ScienceDirect and SpringerLink databases, as well as the Mexican government's special education websites, included the following keywords: autism, sensory processing disorders, occupational therapy, sensory profile, Winnie Dunn sensory profile, sensory integration, educational support, and inclusive education.

After reviewing and analyzing the literature, it became clear that there was a need to promote the

use of the sensory profile as a basis for implementing strategies to help autistic children regulate their behavior, improve their concentration, and generally make the necessary adjustments for their well-being. This makes the sensory profile a support tool in the educational setting, which led to the definition of both the title and structure of this article.

RESULTS

When addressing disruptive behaviors, it is crucial to first rule out any medical conditions through evaluations by health specialists. Once this step is completed, special attention should be given to sensory integration³. Sensory integration plays a vital role in how an individual processes sensory information, and this processing significantly influences their behavior and learning⁴. In the past, individuals exhibiting behavioral issues were often labeled as having a behavioral disorder. However, it is now essential to determine whether these behaviors may stem from a sensory processing disorder, which can affect the senses of hearing, smell, sight, taste, touch, proprioception, and vestibular function, among others⁵.

Sensory problems

Many people within the autistic spectrum present one or more alterations in sensory-perceptual processes, especially in the following **sensory categories**, which are classified as:²

- Exteroception, which includes the senses of sight, smell, taste, hearing, and touch.
- Proprioception, which includes posture in space, the sensation of movement and force, body imbalance, and weight.
- Interoception, which includes pain in internal organs, internal temperature, and hunger and thirst.

The anomalies detected in the sensory categories can be presented in the form of sensory response through “hypersensitivity, hyposensitivity, and sensory fascination or self-stimulation” (the first two corresponding to a hyper- and hypo-responsive sensory modulation, respectively), where a person with ASD may even present all three when perceiving and responding to different sensory stimuli.²

To assess sensory integration problems, it is necessary to use observation and various diagnostic tests only by a person with the appropriate profile, such as an occupational therapist, physical therapist with sensory

integration, among other profiles related to the subject⁵. This is to find those sensory aspects that can significantly hinder the expected development of children within a school.

Dunn's four quadrant sensory processing model

The term sensory integration was introduced by occupational therapist Dr. Jean A. Ayres³, based on his theory of sensory integration. Several specialists in the area have based their theories of sensory processing on his work, such as occupational therapist Winnie Dunn, who developed Dunn's Four Quadrant Sensory Processing Model. It consists of a questionnaire designed based on the following constructs: **neurological thresholds** and **behavioral responses**⁶.

The original version of the sensory profile was developed based primarily on Dunn's Four Quadrant Sensory Processing Model and was initially designed for children between 3 and 10 years old. However, it was necessary to develop different versions to cover several needs, finally arriving at the Sensory Profile-2⁷.

- Sensory Profile-2

The Sensory Profile-2 (PS-2) can be defined as “a set of standardized instruments for assessing a child's sensory processing patterns in the context of daily life⁷,” meaning that this set of instruments assesses a person's neurological ability to optimally utilize stimuli from the body's sensory receptors (hearing, smell, sight, taste, touch, proprioceptive, and vestibular), generating adaptive responses to environmental demands as well as optimal learning and interactions.

The PS-2 has expanded its age range to include children between 3 to 14 years and 11 months old and includes three questionnaires:⁷

- PS-2 Child Questionnaire.
- PS-2 Short Questionnaire.
- PS-2 School Questionnaire.

These questionnaires collect information from parents, teachers, and other caregivers, indicating the frequency the child exhibits certain behaviors. The responses are: “*almost always or always*,” “*frequently*,” “*half the time*,” “*occasionally*,” “*rarely or never*,” and “*not applicable*.” These responses generate a score from 0 to 5 for each item⁷.

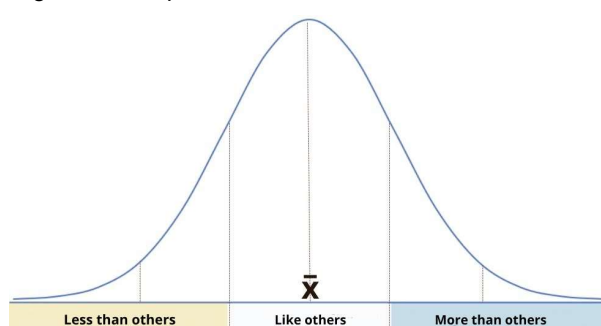
The PS-2 questionnaires include:

- Sensory system scores (auditory, visual, oral, tactile, movement, and body position).
- Behavioral scores (behavior, socioemotional, and attentional).
- Sensory quadrant or pattern scores (seeking, avoidant, registering, and sensing).

- School factors.

In graph 1 (Gaussian bell), we can see the five categories that comprise the score classification system, which reflect how a child responds to sensory stimuli compared to other children of the same age. Therefore, it is considered that when the score is close to the arithmetic mean, that is, the results are within a normal parameter or are expected ("like the others"). On the other hand, when the score is far from the arithmetic mean on the right side, it is considered that the child presented an exaggerated response to stimuli; contrary to the case, if the data were skewed to the left side, it means that there was little response to sensory stimuli on the part of the child.

Figure 1: Graph PS-2



- What is the Use of a Sensory Profile (PS-2)?

Based on the scores obtained from the questionnaires, information from the interviews with parents (and teachers, when applicable), and information from other professionals in the field, plus the results of the child-therapist interaction tests and observations, the occupational therapist (or equivalent) will interpret all the information gathered from the evaluated child. This is where the clinical and experienced therapists come into play to provide the PS-2 results, as well as to suggest continuing and/or adding therapies, and may also suggest referring the child to experts in certain areas.

In general terms, the results obtained from the PS-2 provide all the relevant information about the child being evaluated, including their strengths and the challenges that their daily life presents. Having this information allows us to provide an overview of the child's sensory processing to complement a diagnosis of autism and to be able to implement a treatment (sensory integration therapy), focused mainly on emotional self-regulation, the development of social and motor skills.

It is recommended that the PS-2 be repeated every 2 or 3 years or, depending on the child's progress, if he or she is giving better adaptive responses⁷; however, if there are very large

changes, sensorially speaking, it is suggested that it be repeated sooner.

- **Q-Global web platform**

When administering the PS-2, it is expected that the professional in the field will be in direct contact with the caregiver(s)/parent(s) and the child being evaluated. Unfortunately, there are geographic locations where specialists are not available in person. However, it is feasible to administer the PS-2 remotely.

The Pearson Spain website offers a web platform called **Q-global**, a tool in which you can manage the various services offered by Pearson. This allows you to access, administer, and evaluate tests, as well as easily and effectively share the results obtained. Occupational therapists, psychologists, neuropsychologists, and other specialists can access **Q-global** from any mobile device with an internet connection.⁸

In this article, we conclude that utilizing **Q-global** is an outstanding option for professionals in the field to administer the PS-2 remotely. An occupational therapist or a similar professional can administer the PS-2 through the examining application, while the patient participates from a different geographical location on the examined application.

Legal framework and inclusive education in Mexico

In the field of education in Mexico, a primary goal is to achieve inclusive education that emphasizes quality and equity, as supported by Article 3 of the Political Constitution. This article defines that inclusive education extends beyond simply integrating students into classrooms; it also involves transforming educational systems to meet the diverse needs of individuals with special requirements, ensuring they receive a comprehensive educational experience⁹.

As part of this transformation, both public and private institutions must provide the essential educational resources—both material and human—and make reasonable adaptations. This includes ensuring that teaching staff receive adequate training to effectively address the educational needs of individuals with ASD as well as those with other physical or mental disabilities.

One of the key resources available to the Mexican government for supporting, guiding, and fostering the development and inclusion of individuals with different abilities is the USAER (Regular Education Support Service Units). These units assist children and adolescents (NNA) attending regular schools. However, not all children and adolescents benefit from a conventional school setting. For this reason, Mexico has established the Multiple Care Center (CAM), which offers

specialized facilities and trained personnel to support children and adolescents with different abilities, integrating them either full-time or part-time^{2,9}.

In line with CAM's recommendations, the Autism Spectrum Inventory (IDEA) is suggested as part of the evaluation process for individuals with (ASD) in educational settings. It is advised that teachers, therapists, and specialists working with individuals with autism keep this spectrum profile in mind for future reference². Additionally, having the Sensory Profile-2 readily available is recommended. According to existing literature¹⁰, while a teacher might initially struggle to address the sensory challenges faced by their student, having the results from the Sensory Profile-2 can empower them to make informed adaptations to the classroom environment¹¹, schedules, or overall school structure to better support their student with ASD.

DISCUSSION

While it is expected that the professional in charge of administering the PS-2 be physically present, especially during direct observation of the child being tested, as well as when providing precise instructions to parents/caregivers for proper completion of the questionnaires, we recognize that in practice this is not always possible due to various factors.

For this reason, it is highly recommended that when using the **Q-global** web platform alongside the application being tested, the child and/or non-speaking child have the support of a trained intermediary and parents/caregivers. This support is intended to ensure that the results obtained reflect the child's sensory characteristics as accurately as possible, contributing to a more accurate and effective intervention. However, the methodological limitation of the need for physical interaction and direct observation with the child, in addition to the administration of tests that reinforce the results of the PS-2 questionnaire, persists.

On the other hand, the results of the PS-2 provide an overview of a child's sensory processing, describing their strengths, challenges, and daily life challenges. This tool also provides support in the educational setting, enabling justifiable adaptations for students with ASD. Therefore, it is necessary to propose and disseminate the need for laws that guarantee the widespread dissemination of sensory topics and the existence of tools like the PS-2. This also requires ensuring that these types of assessments are more affordable, as well as making mandatory training for teachers, administrators, and specialists in the educational field, among others, so that they can make effective use of the results

of these types of assessments and design and implement specific strategies to promote a more inclusive educational environment tailored to the individual needs of each student with ASD.

CONCLUSIONS

Mentioning the psychologist specializing in autism, Ángel Rivière, with the phrase: "No two autisms are the same," leaves us with much to think about. From the moment we talk about an autism diagnosis and its 3 levels of support, we are already talking about a variety of characteristics that people with ASD can have. Adding that a person with this diagnosis could have some type of concurrence, we further expand the combination of characteristics that people within the autism spectrum can present, which is why we emphasize making use of the tools that are currently available.

Among the tools useful for CAM, as well as for the support provided through USAER in regular public schools, the PS-2 can also be used in private inclusive schools, enabling them to more naturally implement their plans, strategies, application of methods, programs, and other educational tools. The benefits will be reflected primarily in students with ASD, but also in their classmates, as well as among teachers, who will have access to relevant information that will complement and facilitate their commendable work as educators.

On the other hand, the use of the sensory profile is not limited to the educational sector; it is such a useful and necessary tool that it is also useful in the healthcare and therapeutic sectors, as it will dictate how to provide better care and service to individuals with ASD. Without limiting the use of this tool, it is also very useful at home for parents/caregivers to use the information it contains to investigate the topic through specialized literature, consultations with specialists, and the goal of making adjustments at home, in care, in home therapies, among other adaptations.

For a person with ASD to receive the support and care they need, a great effort is required, an effort that is compensated by the work carried out by various individuals, associations, and public and private institutions working on the issue of inclusion, awareness, and dissemination of information about autism. There is still a long way to go, but where as a society we have made significant progress.

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Dolores Ojeda Carreño: Conception, design of the article's structure, literature review, information analysis, manuscript writing, editing, and final document formatting.

Erika Vidaurreta Carrasco: Literature review, manuscript writing, and critical review of its content.

María Magdalena Nolasco Cruz: Manuscript writing, supervision, and validation of the article's content.

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