

Proposal for an Educational Care Program for Children with Autism -Based on Sensory Integration Theory -

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Abstract:

The study aims to develop the sensory abilities , most specifically the balance sense through an educational program based on sensory integration theory . The sample of the study comprises two children with autism , aged between (9-11 years) , with a moderate level of autism disorder. The following tools were used in the pre-diagnosis of the children's level: the CARS Autism Rating Scale, the Sensory Disorders Survey Form, and the Sensory Profile. The educational program based on sensory integration designed by the researchers was also used for treatment, therefore , the study results were as follows :

The Sensory integration disorders in children with autism vary in severity, with some being more common, such as balance, deep pressure, and touch.

The Sensory integration disorder can be dual (involving two senses) or multiple.

There are systematic and specialized methods to deal with these disorders.

There is noticeable effectiveness in the proposed training program based on Sensory Integration Theory in improving sensory disorders in children with autism, in more precise terms :

The pre-diagnosis of autism cases reveals significant sensory disorders in the sense of balance, while the post-diagnosis shows improvement in sensory disorders, specifically the sense of balance.

Keywords: Autism disorder, pre-test, post-test, educational care, sensory integration program, improvement, balance

Résumé :

Le but de l'expérience était de développer des capacités sensorielles et précisément le sens de l'équilibre à travers un programme de soins éducatifs basé sur la théorie de l'intégration sensorielle (sensory intégration) et confectionné par les deux chercheurs . On a adopté la méthode expérimentale.

L'échantillon de l'étude était composé de deux enfants pensionnaires de l'institution du 8 mai 1945 dans la ville d'Annaba âgés de (9-11 ans). Dans le diagnostic primaire, les outils suivants ont été utilisés: l'échelle d'auto-évaluation de Carz, le questionnaire de perturbation sensorielle, la liste sensorielle.

Le test a priori a révélé l'existence du trouble de l'intégration sensorielle à différents degrés, notamment: la sensualité profonde , l'équilibre, le tactile .

-Ce trouble peut être composé (réunit deux ou trois sens).

-Il existe des méthodes spécialisées pour remédier ces troubles.

Le post-test a donné les résultats suivants :

- Il existe une efficacité considérable dans le programme de formation proposé basé sur la théorie de l'intégration sensorielle dans l'amélioration des troubles. Autrement dit :

- Le diagnostic a priori des cas d'autisme a montré des perturbations sensorielles importantes dans le sens de l'équilibre.

- Le post-diagnostic des mêmes cas révèle une amélioration des perturbations sensorielles, en particulier le sens de l'équilibre.

Mots-clés: Trouble , autisme –test Apriori, test A posteriori ,soins éducatifs - programme d'intégration sensorielle ,amélioration, équilibre.

Introduction:

Autism disorder exists in every country and region of the world, and within families of all racial, religious, and economic backgrounds. This means that it is a disorder that knows no geographical, social, economic, or racial boundaries, affecting some children regardless of their social, economic, or racial conditions. Autism spectrum disorder is one of the disorders that occurs in early childhood (from birth to the third year of life , and it is therefore classified under the umbrella of what is termed developmental disabilities, which result from abnormalities, distortion or deviations in various aspects of psychological development) (Mohamed El-Said, 1997: p. 12).

Gardner (2005, p. 72) explains that children with autism suffer from severe sensory integration deficits among the different senses, which impacts their ability to learn and their behavior, both within the family and in care centers (psychological and educational care).

Hala Saeed (2009, pp. 89-90) indicates that sensory integration therapy is based on the premise that the nervous system connects and integrates all sensations from the body. Therefore, a disruption in the integration or harmonization of these sensations, such as (smell, hearing, sight, touch, balance, taste, proprioception), may lead to symptoms of autism. The therapy involves analyzing these sensations and then working on balancing them. However, in reality, not all

children with autism exhibit symptoms indicative of sensory integration disorder.

The process of sensory integration occurs as a person receives information from different senses and sends it to the brain, which then processes it and provides appropriate responses. The closest example to the concept of sensory integration is the integration of the senses of touch and smell with sucking, breathing, and swallowing during breastfeeding in a newborn. The first to lay the foundations of the theory of sensory integration was occupational therapist (Jean Ayres), who added to our five known senses other hidden senses such as the sense of balance (vestibular), which provides information through the inner ear about gravity (space, balance, movement) via the position of the head and body relative to the earth's surface, and proprioception, which provides sensory information from the joints, muscles, and ligaments about body parts (Faten Al-Daman, 2008: pp. 30-36).

From the above, it becomes clear that a child with autism exhibits a significant deficiency in responding to sensory stimuli and consequently suffers from a sensory processing disorder. This highlights the importance of incorporating sensory integration programs in psychological and educational care centers.

From this perspective, the topic was chosen under the framework of treatments in the field of intellectual disability, specifically the treatment of sensory integration disorders in children with autism. The

program aims to improve the sensory abilities (sense of balance) in children with autism, which may contribute to their adaptation to the environment and integration into society.

In this article, following the abstract and introduction, we will present the research problem, its questions, and hypotheses, as well as the objectives, motivations, and importance of the study, along with operational definitions. The practical aspect will cover the methodology of fieldwork, including the study method, study population and sample, temporal and spatial boundaries, and both the exploratory and main studies in detail.

We will also present the data collection methods, which include an educational care program based on the theory of sensory integration for children with autism, and then results will be displayed along with their analysis.

1. The Problem

Children with autism spectrum disorder suffer from difficulties in three main functions:

communication, forming relationships with others, and sensory abilities. This group of children exhibits abnormal patterns of sensory responses that differ from others, affecting their ability to adapt to their surroundings.

The problem for autistic children lies in the lack of integration between the senses, with each sense functioning separately. This disconnection occurs not only at the sensory level but also within the sub-functions of a single sense, preventing proper sensory perception (Amal Mahmoud, 2010, p. 36).

Researchers like Gardner (2005, p. 67) have highlighted the characteristics of autistic children, which include deficits in motor skills (both gross and fine), repetitive

stereotyped behaviors (both verbal and motor), a need for routine and order, anxiety, and sensory impairments. Ibrahim Mahmoud Badr (2004, pp. 112-113) explained that autistic individuals have unusual responses to sensory stimuli, such as ignoring certain sensations like pain or temperature, while showing extreme sensitivity to specific stimuli (e.g., covering their ears to avoid certain sounds or avoiding touch). Sometimes, they may be overly fascinated by certain sensations, such as an exaggerated reaction to light or smells.

Mansour Abdullah (2004, p. 58) noted that an autistic child's sensory responses to stimuli are inconsistent. While they may be indifferent to some stimuli, they can be hypersensitive to even the slightest changes in others, leading them to cover their ears or eyes to block out the stimuli.

Nemat Abdul Hamid (2013, pp. 146-148) argued that sensory integration dysfunction in autistic children results in inappropriate responses due to poor information reception. The failure to gather information properly from the environment due to sensory system malfunctions leads to programming and cognitive processing issues, thus hindering the learning process. Sensory integration works to organize the senses of autistic children, allowing information to be correctly processed by the brain. It also fosters coordination among different senses to function as an integrated system.

Ayres (1972, p. 172) developed a theoretical model called Sensory Integration (SI) theory, which is based on principles from neuroscience, biology, psychology, and education. This theory indicated that children with learning disorders have difficulties processing and

integrating sensory information, affecting their learning and behavior. These children suffer from sensory information integration issues and the inability of higher brain centers to regulate sensory-motor centers in the brain.

Therefore, sensory integration makes sensations organized, enabling an individual's body and environment to interact acceptably. It allows the individual to use their body effectively during environmental interactions (Amal Mahmoud, previously cited, p. 56). Consequently, the study by Laura et al. (2004, pp. 215-228) indicated that organized sensory processing in adolescents with autism spectrum disorder continues across different life stages and has positive effects in treating and alleviating Asperger syndrome symptoms in adulthood. Nemat Abdul Hamid (previously cited, p. 156) confirmed that education based on sensory integration significantly improves the low motor skills of autistic children. It also positively impacts visual communication, reduces repetitive stereotyped movements, and enhances physical fitness and motor efficiency.

From the above, it is clear that autistic children exhibit significant sensory response deficits. Autistic children in Algeria similarly suffer from these deficits, displaying many behavioral and learning problems, along with limited interests and activities, and engaging in abnormal behavioral patterns. These symptoms create barriers for caregivers and educators in families or specialized centers (CPP) to assist them (psychological and educational care). This situation leads to feelings of exhaustion and boredom among caregivers, potentially reducing their enthusiasm and

effort in caring for these children. Additionally, these symptoms limit the children's ability to benefit from the provided services (psychological and educational care).

Given that this group of children and this type of therapy (sensory integration) have not received sufficient attention in Arab studies in general, and Algerian studies in particular, the goals of special education aim to provide and ensure educational care for children in general, and autistic children specifically. The researchers, having worked as educational psychologists in institutions for mental disabilities, particularly with groups of children with autism spectrum disorder, observed the learning difficulties these children face due to sensory stimulus processing issues. This provided an opportunity to focus on sensory integration disorder and consider proposing an educational care program based on sensory integration theory for autistic children. The aim is to improve their sensory abilities, specifically the sense of balance or body position in space, and achieve sensory integration to ensure proper responses to sensory stimuli.

Thus, the researchers' interest in the current topic stems from the following main question: What are the most common sensory integration disorders among children at the "Psychological and Educational Center" 8 May 1945 in Annaba Province? Can they be treated?

From this, we derived the following questions:

- What are the common disorders among autistic children?
- Is there a dual sensory disorder (involving two or more senses)?
- What methods are used to mitigate the impact of this disorder in cases?

- Is the proposed sensory integration program noticeably effective?

2.Hypotheses:

General Hypothesis 1:

Sensory integration disorders in autistic individuals vary in severity and have treatment methods.

Sub-Hypotheses:

1. Sensory disorders in autistic individuals can be dual (involving two or more senses).
2. There are systematic methods to reduce sensory integration disorders.

General Hypothesis 2:

The proposed program for treating sensory disorders in autistic children is noticeably effective.

Sub-Hypotheses:

1. Preliminary diagnosis of autism cases shows significant sensory disorders, particularly in the sense of balance.
2. Post-treatment diagnosis of the same autism cases shows improvement in sensory disorders, specifically in the sense of balance.

3.Study Objectives:

The study aimed to:

Identify the types of sensory integration disorders suffered by autistic children at the Psychological and Educational Center 8 May 1945 in Annaba Province.

Contribute to reducing sensory integration disorders by proposing an appropriate treatment program.

4.Study Motivations:

Given the opportunity to work with individuals with special needs, particularly those with intellectual disabilities (for both researchers), the focus was directed toward autistic individuals. These children have unique behavioral and sensory

characteristics that are often misunderstood and challenging to treat.

5.The Importance of the Study:

This study falls within the scope of therapeutic services for individuals with special needs, specifically autistic individuals. Its significance and effectiveness are evident in the social sector of Annaba Province, where there are four institutions for intellectual disabilities, and autistic children constitute a considerable percentage of the beneficiaries. The challenges in understanding and dealing with this group are faced by both the community and the teams working with them. Thus, developing a treatment program based on symptom diagnosis is essential, even if the program is simple and aligns with the available resources at the institution and the child's environment.

The importance of the current study (theoretically and practically) is summarized as follows:

Providing important theoretical frameworks and principles for those interested in this field, aiding in the development of educational, training, and therapeutic programs for autistic children.

Enabling autistic children to benefit from sensory integration activities, games, and skills that focus on the body and movement as fundamental pillars. It is easier to engage their minds through sensory and motor channels, allowing the child to perceive through direct senses what we want their minds to comprehend (through the proposed program units implemented by the researcher).

Highlighting the importance of applying and generalizing sensory integration programs in centers dedicated to educating and training autistic children as an essential part of their therapeutic programs.

6.Operational Definitions:

(A) Autistic Child:

A child between the ages of 6 and 12 years, enrolled in the May 8, 1945 Institution for Intellectual Disabilities in the Wilaya of Annaba, who meets the conditions and characteristics of the research sample, specifically exhibiting sensory integration disorder.

(B) Educational Care:

Refers to the general attention given by a multidisciplinary team to the autistic child at the institution for intellectual disabilities, as well as the family. This attention encompasses the child's educational activities, movements, and skills (psychological, psychomotor, cognitive) that help them adapt to various situations (difficult, moderate, easy). This is achieved through specific training aimed at acquiring or enhancing the targeted skill.

(C) Sensory Integration Disorder:

A disorder that occurs when the integration of multiple senses is not adequately processed to provide appropriate responses to environmental demands.

(D) Sensory Integration Program:

A set of educational activities tailored to the lives of disabled children in general, and autistic children in particular. These activities play a crucial role in improving the reception and processing of sensory stimuli, contributing to better interpretation and integration of sensory information, and more appropriate responses to sensory stimuli. After diagnosing sensory integration disorder, researchers proposed these activities to mitigate its severity in autistic children.

1.Study Methodology:

The researchers primarily relied on the experimental method in the current study. The experimental method involves

deliberate and controlled alteration of specific conditions of a reality or phenomenon under study, observing the resulting effects on this reality or phenomenon, and interpreting them (Amer Ibrahim Qandilji, 2013, p. 149). Given the nature of the study and the characteristics of its sample and cases, a pre-test and post-test design was adopted. This experimental design aimed to test the effectiveness of the sensory integration training program in developing and improving responses to sensory stimuli (balance sense) in children with autism.

2.Study Population:

The study population refers to the entire group of elements that the researcher aims to generalize the results to, which are related to the studied problem (Amer Ibrahim Qandilji, previous reference: p. 150).

The study population consisted of all autistic children present at the psycho-pedagogical centers for the mentally disabled in the Wilaya of Annaba, totaling approximately 60 autistic children. These institutions included four centers in the year 2022-2023:

- The Psycho-Pedagogical Center for the Mentally Disabled Annaba 2 (May 8, 1945).
- The Psycho-Pedagogical Center for the Mentally Disabled Annaba 1.
- The Psycho-Pedagogical Center for the Mentally Disabled in Boukhadra.
- The Psycho-Pedagogical Center for the Mentally Disabled in El Hadjar.

The May 8, 1945 Institution was chosen for ease of program implementation, where the number of autistic children is 21.

3. Study Boundaries:

(1) Human Boundaries:

The final study group consists of 2 autistic children aged between 9 and 12 years.

(2)Spatial Boundaries:

The study was conducted with autistic children attending the Psycho-Pedagogical Center for the Mentally Disabled Annaba 2 in the city of Annaba, Algeria.

(C)Temporal Boundaries:

The study was conducted from 1/03/2023 to 17/05/2023, lasting for two months.

4. Study Sample:

A sample can be defined as a model that includes a part or a segment of the units of the original population concerned with the research. It is representative of the population, carrying its common characteristics. This model or segment saves the researcher from studying all the units and individuals of the original population, especially in cases where it is difficult or impossible to study all those units (Amer Ibrahim Qandilji, previous reference: p. 115).

Out of 21 autistic cases, 11 cases met the conditions allowing the proposed program to be applied and were involved in the exploratory study. These children exhibited symptoms of sensory disorders.

4.1Exploratory Study:

4.1.1 The Sample:

The sample of the exploratory study consisted of 11 autistic children, both boys and girls, who exhibited deficiencies in sensory responses (symptoms of sensory integration disorder). Their ages ranged

However, the final study focused on only 2 cases out of the 11, as they met the key conditions of the intended sample and allowed the researchers to test the validity of the study hypotheses. These conditions included:

- The children must have a clear deficiency in responding to sensory stimuli (balance sense) before the program's application.
- The children must regularly attend the center, with no long absences (a crucial condition for tracking the program's application stages).
- The children must show an increased performance (respond well to the activities included in the program without being significantly affected by other distracting stimuli, such as a child with a behavioral disorder who continuously rotates objects with their hand).
- Selection by the researcher/apPLICATOR of children with whom they have a good relationship to ensure better responsiveness.

from 8 to 12 years, with an average age of 9.279 years and a standard deviation of 0.61 years. The purpose of this sample was to standardize the study tools and answer the main research question.

4.1.2 Results of the Exploratory Study for the Sample:

Table 1: Sensory Disorders Identified from the Sensory Checklist

No	case	Sensory Disorder Severity	Vision	Hearing	Touch	Smell	Taste	Proprioc eption	Balance
1	S.B	mild	Normal	Over	mixed	normal	over	low	low

2	A.S	mild	Normal	Over	normal	normal	normal	low	low
3	M.M	mild	Low	normal	over	low	over	over	low
4	Z.B	moderate	Low	Over	over	normal	low	over	over
5	A.D	mild	Normal	low	normal	normal	normal	over	over
6	A.N	moderate	Low	Over	over	low	over	over	over
7	R.H	moderate	Low	low	over	normal	normal	low	normal
8	F.B	mild	Normal	low	over	normal	normal	low	low
9	R.L	moderate	Low	normal	low	normal	low	low	mixed
10	O.D	moderate	Low	over	low	normal	normal	low	low
11	A.B	moderate	over	normal	low	low	low	over	over

The Main Question:

What are the most common and prevalent sensory integration disorders among autistic children at the Psycho-Pedagogical Center for the Mentally Disabled Annaba 2?

The General Hypothesis 1:

Sensory integration disorders among autistic children vary in severity and have treatment methods.

From the table, it is evident that autistic children suffer from clear deficiencies in sensory processing. The most common sensory integration disorders (those that occur most frequently) at the center are as follows:

Table 2: Most Frequent Sensory Disorders

Most Common Sensory Disorders	frequency
Balance sense	10
Deep Sense	11
Touch Sense	10

Therefore, the common disorders among autistic individuals are: (balance sense, deep sense, and touch sense) .

Sub-question 1:

which consists of the following "Is there a dual sensory disorder between two or more senses?"

Sub -Hypothesis 1:

"The sensory disorder in autistic individuals can be dual."

From the table, it is clear that autistic children at the Annaba 2 Psychological and Pedagogical Center exhibit symptoms in various senses (hearing, vision, touch, smell, taste, deep sense, balance). This means that an autistic child has deficits in more than two senses (i.e., the autistic child has a dual sensory disorder between two or more senses). The disorder can affect all senses, with the most affected sense showing the most prominent symptoms, which confirms Partial Hypothesis 1.

Sub-question 2:

What are the adopted care methods to reduce sensory integration disorder?

Sub-Hypothesis 2:

"There are systematic care methods to reduce sensory integration disorder."

Before answering this question, we should highlight the specificity of the disorder and the specificity of care in professional practice, the scientific understanding of the reality of this disorder, and thus the scientific competencies required in specialists to address sensory disorders.

Through this practice, the speech therapist has shown great interest in the topic of sensory integration disorder, has trained and somewhat specialized in it. Despite the interest of the working team in the subject and their care for the cases, the strategies and methods adopted by the speech therapist are more practically significant. They are as follows:

Table (3): Methods and Strategies Followed to Develop an Individual Treatment Plan for Sensory Disorders

Methods and Strategies and Their Principles
<ol style="list-style-type: none">1. Identifying the most affected sense2. Observing the symptoms of the sense to determine the threshold through repeated occurrences3. Developing a treatment plan to reduce the excessive repetition of the behavior4. Implementing the treatment plan (by generalizing its application among specialists and the family)5. Continuously assessing the plan

This confirms Partial Hypothesis 2. With the confirmation of Partial Hypothesis 1 and Partial Hypothesis 2, General Hypothesis 1 is realized, which states: "Sensory integration disorders in autistic individuals vary in severity and have treatment methods."

4.2 The Basic Study:

4.2.1 The Sample:

The final sample for the study was intentionally selected from groups 1 and 2

at the Annaba 2 Psychological and Pedagogical Center for Mentally Retarded Individuals. The sample consisted of two male children, one aged 9 and the other 12. Both children had common or more pronounced deficits in sensory processing, specifically in the sense of balance.

Sample Selection Criteria: (previously mentioned).

Table (4): Characteristics of the Sample Members (by Age and Gender)

Number	case	Chronological Age	Gender
1	A	9	male
2	B	12	male

Note: The researchers relied on the movement dimension included in the sensory profile to analyze symptoms of sensory disorders specific to the balance sense (before and after).

5. Study Tools: The study utilized the following tools:

5.1 Childhood Autism Rating Scale (CARS):

This scale, developed by Schopler et al. (1988), is used to assess autism by categorizing a child's behavior and characteristics compared to a "typical child". It differs from other scales in its ability to identify developmental delays in various aspects, allowing for a precise diagnosis of autism severity in children. (See Appendix 1)

Description and Application of the Scale:

The scale consists of 15 items, with each item comprising a set of behavioral indicators that describe the degree of autism in children. Each item is rated by placing an "x" next to the appropriate assessment, and each rating corresponds to the following grade:

- Normal or appropriate behavior for the child's age: Grade 1
- Mildly abnormal and irregular behavior: Grade 2
- Moderately abnormal and irregular behavior: Grade 3
- Severely abnormal, inappropriate, and significantly impairing behavior: Grade 4

Scale Correction:

The degree of autism is assessed based on the grades obtained in the total sum of the scale's dimensions.

Grade Categories:	Assessment of Autism Severity
15-30	There is no autism to mild autism.
31-45	Moderate autism
46-60	Severe autism

Note: Autistic children were diagnosed by several specialists (psychiatrist, general practitioner, psychologist, speech therapist, sensory specialist) before coming to the specialized institution (the center), where this scale was applied to determine the type

and severity of the disorder. The researchers only sought to scientifically confirm the disorder and its degree using another method.

5.2 Sensory Disorder Survey Form: The researchers used a sensory disorder survey

form consisting of 15 statements indicating symptoms of sensory disorders in autistic children. The form was handed to the parents or guardians who were asked to fill it out, responding with yes or no. If it was found that the child exhibited sensory disorders such as self-stimulation, eating issues, movement problems, etc., then the Sensory Disorder Diagnosis Scale was applied, also known as the Sensory Profile. (See Appendix 2)

5.3 Sensory Checklist:

The Sensory Checklist was developed by Sue Larkey, author of the book "Practical Sensory Programmes For Students With Autism Spectrum Disorder And Other Special Needs". It was translated and standardized by Dr. Ahmed Mohamed Abdel-Fattah, a speech therapist and autism specialist at the Arab Doctors Union, Maak Center (El Arish), who holds a Master's degree in Psychological Health specializing in Sensory Integration as part of the tools for his thesis.

Description of the Scale: The scale consists of statements divided into eight main dimensions representing aspects of sensory disorders in autistic children: (Movement, Visual, Visual-Spatial Awareness with People and Objects, Touch, Eating, Auditory, Smell, Sleep). (See Appendix 3)

Application and Scoring: The scale is applied by the parent, caregiver, or specialist who monitors the child's condition based on their observations of sensory symptoms in autistic children. There are no right or wrong answers, but it is important that each statement is honestly and accurately answered regarding the child's sensory symptoms. All statements must be answered, and if there is doubt about any statement, it is deferred for later

evaluation after the examiner observes and interacts with the child.

Each statement has three choices (Frequently, Sometimes, Rarely) which correspond to scores of 3, 2, and 1 respectively. The responses are interpreted as follows:

- 'Rarely' indicates that the child exhibits the behavior once or twice within six hours.
- 'Sometimes' indicates that the child exhibits the behavior 3-4 times within six hours.
- 'Frequently' indicates that the child exhibits the behavior at least 5-6 times within six hours.

Based on these responses, the parent or caregiver places an "x" in the box that they feel accurately represents the child's symptoms. The grading interpretation scale is as follows:

- Score range (195-117): Mild sensory processing disorder.
- Score range (273-196): Moderate sensory processing disorder.
- Score range (351-274): Severe sensory processing disorder.

5.4 Dimensional Diagnosis: The researchers relied on the movement dimension included in the sensory checklist (see Appendix Number 4).

5.5- The therapeutic training program for sensory development based on sensory integration theory (student preparation) (see Appendix Number 5).

This program was designed by the researchers, relying on the book "Building Bridges through Sensory Integration," which includes suggested activities for sensory development. It is the only book translated into Arabic by Ellen Yack and others, translated and edited by Professor Muneer Zakaria (2017), and a guide for

sensory-motor integration games and activities for autistic and intellectually disabled children by Ibrahim Al-Hashimi. The student also based it on previous studies like that of Mohammed Riyadh and others (2017).

This was done within the framework of a set of principles and foundations (the seven approaches to building programs for individuals with special needs) upon which autistic children's programs are based. The program takes into consideration evaluating the children's characteristics and varying

levels of their abilities. It is essential to consider the individual differences among these children and address their needs and interests. The program should provide familiar activities, offer necessary reinforcement and support at the right time, ensure that activities or games are within their capabilities, assist them in performing targeted tasks and activities (instruction, modeling), and gradually withdraw assistance to encourage independence in executing activities (response to instruction).

5.5.1 The program content includes:

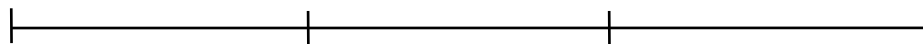
- Walking in a straight line with balance forward.
- Walking in a straight line with balance backward.
- Walking in a straight line with side balance.
- Walking in a straight line with balance while carrying a small ball on a spoon placing it in a bucket.
- Bear walk.
- Military crawl.
- Walking like a manual wheelchair.
- Passing between legs.
- Passing between cylinders.
- Standing on one foot.
- Standing while lifting the opposite hand and foot.
- Running forward and using a machine.
- Running backward.
- Lying on the stomach on a rubber ball.
- Lying on the back on a rubber ball.
- Lying on a rubber ball while walking and using the feet for support.
- Changing head position downward.
- Rolling to the right.
- Rolling to the left.
- Front somersault followed by a back somersault.
- Jumping upward.
- Jumping using a rubber ball.
- Rabbit hop.
- Jumping on one foot.
- Jumping on both feet in a horse stance.
- Walking on balance boards.
- Jumping on a trampoline.



- Using a swivel chair.
- Going up and down a ladder staircase.
- Using a swing.
- Using a balance board.

The program evaluation key is:

- Very unacceptable
- Unacceptable
- Very acceptable
- Acceptable



Note: The program design must adhere to the principles outlined in the major approaches for developing programs for individuals with special needs, which are:

1. Functional approach.
2. Integrative approach.
3. Environmental approach.
4. Spiral approach.
5. Special needs approach.
6. Life skills approach.
7. Problem-solving approach.

The current therapeutic training program consists of 30 sessions, with each session lasting between 30-45 minutes. These sessions are conducted 3 to 5 times per week over a period of 2 months, at the offices of both the speech therapist and the psychomotor re-education specialist, as well as at the playground and play area.

- General Program Planning:

The planning process includes defining objectives, program content, strategies, methods used in implementation, determining the time frame, number of sessions, session duration, and location of implementation, followed by program evaluation.

5.5.2 Program Objectives:

- Overall Program Objective: The program aims to improve sensory response (balance sense) through sensory integration activities among autistic children aged between 9 to 12 years.
- Subsidiary Objectives: Provide autistic children with experiences

that enable them to interact and adapt to their environment through developing balance sense. Train autistic children in visual-motor coordination.

5.5.3 Strategies and Methods Used in the Program:

Positive Reinforcement: Positive reinforcement refers to all positive events following the desired response that enhance its occurrence and strengthen it. These events include primary, verbal, social, and symbolic reinforcements (Rossen, 2014: p.126).

Modeling: Modeling involves observing other individuals (models) performing a behavior. The idea behind modeling is that individuals acquire behaviors observed in others, whether live or through media. This method is used in training social responses such as greetings, handshakes, speech patterns, clothing choices, room organization, and conversation (El-Sharbini, 2004: p.117).

Prompting: Prompting involves providing additional assistance or hints to help an individual perform a behavior. In behavioral modification terms, prompting means using additional discriminative stimuli to prompt the individual to perform the behavior. Prompts can be verbal, such as verbal instructions or cues like signs, or physical, involving physical assistance (Bartos, 2010: p.83).

5.5.4 Program Standardization:

The standardization of the program proceeded through several procedures to ensure its suitability and effectiveness for the intended purpose:

A) Program Validity: After finalizing the program, the researchers presented it to an educational psychologist and two specialists in speech therapy for their feedback on:

- The appropriateness of the program's skills for the study sample.
- The adequacy of the allotted time for each session.
- The procedures and techniques used to achieve session objectives.

The modifications suggested by the reviewers were discussed and included:

- Increasing the number of sessions needed for certain skills due to the nature of the children's disabilities and the complexity of the skills.

B) Preliminary Testing of the Program:

Approximately 15 days before implementing the training program, the researchers conducted several trial sessions to assess the suitability of procedures for autistic children, focusing on:

- The suitability of activities and different techniques for these children.
- Identifying appropriate methods for interacting with autistic children during program implementation.
- Ensuring the feasibility of using study tools.
- Assessing the appropriateness of the program's time and location.

Based on these trials, adjustments were made to the program to make it suitable for final implementation.

6- Study Results

Pre-intervention Diagnosis Results for both cases:

Table 5: Analysis of Balance Sense Symptoms for Both Cases Before Program Implementation

The Case	Type of disorder	Symptoms of sensory disorder
A	Decrease in the sense of balance	<ul style="list-style-type: none"> • Hyperactive, for example, constantly standing, sitting, and moving • Plays intensely on the swing • Throws himself on the ground • Spins his body on the ground • Swings on the chair • Constant running
B	Excessive sense of balance	<ul style="list-style-type: none"> • Lethargy and lack of movement • Avoids activities that involve

		<p>movement</p> <ul style="list-style-type: none"> ● Afraid when lifting his foot off the ground (e.g., putting on shoes requires sitting) ● Shows no interest in games like swings or slides ● Constantly manipulates objects with his hands
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Results of Post-Program Diagnosis for Both Cases:

Table No. (6): Analysis of Balance Sense Symptoms for Both Cases After Program Implementation (A posteriori Diagnosis)

The Case	Type of disorder	Symptoms of Sensory Disorders
A	Decrease in the sense of balance	<ul style="list-style-type: none"> ● Moderation in motor activity ● Decrease in the threshold for playing on the swing to near normal ● Rarely throws himself on the ground ● Decrease in the threshold for spinning his body on the ground ● Rarely runs continuously and swings on the chair
B	Increase in the sense of balance	<ul style="list-style-type: none"> ● Noticeable motor activity ● Increased interest in activities that involve movement ● Shows relative interest in games like swings or slides ● Loss of fear of lifting his feet off the ground ● Decrease in the intensity of spinning objects with his hands ● More participation in activities with peers rather than withdrawing from them

7. Analysis of Results

Hypotheses:

General Hypothesis 1:

- Sensory integration disorders in individuals with autism vary in severity and have treatment methods.

Sub-Hypotheses:

1. Sensory disorders in individuals with autism can be dual.
2. There are systematic methods to reduce sensory integration disorders.

The exploratory study shows that: Sensory integration disorders in children with autism vary in severity, with some being dual, and there are treatment methods established by specialists, which confirms General Hypothesis 1.

- **General Hypothesis 2:** There is a significant effectiveness in the proposed training program based on sensory integration theory in improving sensory disorders in children with autism.

Sub-Hypotheses:

1. The pre-diagnosis of autistic cases shows significant sensory disorders in the sense of balance.
2. The post-diagnosis of the same autistic cases shows improvement in sensory disorders, particularly in the sense of balance.

Sub- Hypothesis 1:

States that the pre-diagnosis of autistic cases shows significant sensory disorders in the sense of balance. Table (5) shows the analysis of the movement dimension after the pre-diagnosis (including symptoms of sensory disorders related to balance). Before applying the program, significant sensory disorder symptoms related to balance were present, indicating a dysfunction in sensory processing of balance stimuli in children with autism. This means that Partial Hypothesis 1 has been validated.

Sub-Hypothesis 2: Verification of Partial Hypothesis 2, which states that "the post-diagnosis of the same autistic cases shows

improvement in sensory disorders, particularly in the sense of balance." The analysis of the movement dimension after the post-diagnosis of sensory disorders, as shown in Table (6), indicates a noticeable improvement in response to sensory stimuli related to balance in children with autism (study sample) after applying the program. This means that the cases showed acceptable and appropriate responses when exposed to balance stimuli, indicating that Partial Hypothesis 2 has been validated.

- The validation of Partial Hypotheses 1 and 2 necessarily supports the validity of the general hypothesis, which states that "there is a significant effectiveness in the proposed training program based on sensory integration theory in improving sensory disorders in children with autism." The results obtained from the pre- and post-diagnosis of the cases, illustrated in Tables (5) and (6), show a relative improvement in sensory processing of stimuli, confirming the effectiveness of the training program based on sensory integration theory in enhancing sensory abilities in children with autism.

8.General Discussion of Results: The proposed educational care program based on sensory integration theory for developing the sense of balance is effective due to the following components:

Realism of the Training Program: The nature and content of the training program are realistic and suitable for autistic children (the study sample), both psychologically and educationally. Additionally, the activities included in the training program are practical and relevant to the lives of

autistic children, as reflected in the study results.

Integration of the Training Program:

The training program is characterized by the integration of all its elements (goals, activities, procedures, techniques, means, and tools), which has positively impacted the study sample.

Diversity of the Training Program: The training program includes a variety of activities in the field of sensory perception (visual, tactile, motor). The diversity also encompasses the use of various techniques by the instructor during the implementation of the training program (reinforcement, prompting, modeling), which contributed to the autistic children's mastery and retention of the targeted activities.

Use of Repetition: The training on the sensory skills included in the program involved repetition, which significantly aided the autistic children in acquiring these activities in a way that allows them to recall them easily when needed.

- **Effective Connection:** The instructor was keen to achieve this during the implementation of the program, represented by the relationship between:

- The trainers and the two cases
- The enjoyable activities included in the proposed program and the two cases
- The spaces chosen for implementing the program (the speech therapist's office, the psychomotor therapist's room, the play area, the playground) and the two cases.

This result aligns with the findings of studies by Ayman Al-Faraj (2006), Jean & Renee (2007), Jane et al. (2007), Yesim & Gulen (2008), Amal Mahmoud (2010), Sandra et al. (2012), and Nemat Abdel Hamid (2013), which confirmed the

effectiveness of sensory integration theory-based therapeutic programs in improving sensory abilities and reducing sensory disorders and behavioral issues in autistic children. This was also affirmed by Michelle & Larry (2012), who stated that sensory integration therapy has positive effects in treating children with developmental behavioral disorders such as autism and ADHD within a comprehensive treatment plan. (Mohammed Riyad et al., 2017, p. 521)

9. Conclusions: In light of the presentation, analysis, and discussion of the study results, the following conclusions were reached:

(A) The most common sensory integration disorder among autistic individuals is related to the senses of touch, balance, and proprioception. This is emphasized by researcher Jean Ayres in her treatment of sensory disorders in autistic children (Ellen Yak et al., previous reference, p. 57).

(B) Sensory integration disorders in autistic individuals vary in severity, with some being dual disorders, and they have treatment methods established by specialists.

(C) The training program based on sensory integration theory successfully improved sensory skills in autistic children, leading them to become more confident in themselves and in others. They developed a positive self-image and became more interactive with their environment through the sensory skills acquired via the training program. This underscores the importance of sensory education for autistic children and its essential role in training and therapeutic programs provided to them.

Based on this, we recommend the following: The need to design specialized sensory integration programs for each

category of these children according to their individual capabilities and needs.

Conclusion

This work presents a thoughtful and rational exploration of the study titled "Proposal for an Educational Care Program Based on Sensory Integration Theory for Developing the Sense of Balance in Autistic Children." We gathered a comprehensive set of information after a long journey of research and examination of valuable sources (books, theses, and scientific articles). The topic is significant, as sensory integration disorder has garnered considerable attention from researchers, specialists, and parents due to its impact on autistic children, resulting in sensory symptoms that require psychological and educational care based on sensory integration theory. Sensory integration programs are essential for autistic children, especially in their early years, as they can improve the response to sensory stimuli and facilitate proper processing by the brain, enabling better adaptation to and interaction with the environment.

The researchers designed a program that addresses the needs of children experiencing these disorders, working with two cases of autism that met the conditions for educational support and institutional care. After employing various diagnostic tools, the educational and sensory interventions (i.e., post-assessment) revealed the following:

- There is a notable effectiveness in the proposed training program based on sensory integration theory in improving sensory disorders among autistic children. More specifically:
 - The pre-assessment of the autistic cases shows

significant sensory disorders in the sense of balance.

- The post-assessment of these cases indicates an improvement in sensory disorders, particularly in the sense of balance.

Suggestions:

- Include the topic of sensory integration in the curricula of universities that train specialists working with autistic individuals.
- Develop scales to assess sensory disorders in autistic cases by doctoral students.
- Prepare specialized sensory integration programs tailored to the abilities and needs of each autistic child.
- Ensure that all mental health and educational centers for autistic children have sensory rooms to enhance their sensory skills.
- Provide all necessary modern technological tools for sensory integration training within mental health and educational centers for autistic children.
- Individual educational plans for autistic children should include the area of sensory integration.
- Organize seminars and training sessions for specialists working with autistic children, as well as for parents, to help them understand their child's behavior from a sensory perspective and adapt the environment to meet the child's needs while preparing the necessary sensory and motor experiences.
- It is essential to unite efforts from centers, families, and the community to enhance the

capabilities and potential of autistic children.

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