

SENSORY INTEGRATION IN THE CORRECTIONAL WORK OF CEREBRAL PALSY (CP)

СЕНСОРНА ІНТЕГРАЦІЯ В КОРЕКЦІЙНІЙ РОБОТІ ХВОРИХ НА ДИТЯЧИЙ ЦЕРЕБРАЛЬНИЙ ПАРАЛІЧ (ДЦП)

Occupational therapist E. J. Ayres developed sensory integration theory to explain the relationship between impaired interpretation of sensations from the body and outside the body and difficulties in learning learning skills and motor deficits. Sensory integration is the arrangement of sensations that will then be used in some way. Sensory integration dysfunction implies the presence of signs of impairment in the central processing of vestibular, proprioceptive, or tactile sensations that cannot be explained by significant lesions of the peripheral or central nervous system or be caused by cognitive impairment. Sensory integration specialists work with children of various diagnoses, such as cerebral palsy, autism, Down, psychomotor development delay, speech delay, etc. The sensory integration theory, developed by E. J. Ayres (USA), has inspired much research and has had a greater impact on the practice of occupational therapy than any other theory. E. J. Ayres, an occupational therapist, developed sensory integration theory to explain the connection between impaired interpretation of sensations coming from inside and outside the body and difficulties in learning learning skills and motor impairment. This area has been developing since the 60s of the twentieth century, and society is increasingly aware of the need for such work.

For most people, sensory integration occurs automatically, like heartbeat or food digestion.

Sensory integration is the arrangement of sensations that will then be used in some way. Sensations give us information about the physical state of our body and the environment. Sensations are the "food" of the nervous system. The central nervous system, and especially the brain, is designed in such a way that it can organize countless pieces of sensory information into a coherent system. When sensations flow in an organized manner, the brain can use them to shape perceptions, behavior, and the learning process. If the activity of sensory networks is well ordered and the networks are integrated with each other, then the nervous system operates as a whole. The vestibular system plays a unifying role in this process; all other sensations are processed taking into account its messages. Of all the sense organs, vestibular receptors are the most sensitive.

Key words: *sensory systems, sensory modulation, praxis dysfunction, occupational therapy, cerebral palsy*

Ерготерапевт Е. Дж. Айрес розробив теорію сенсорної інтеграції, щоб пояснити взаємозв'язок між порушенням інтерпретації відчуттів від тіла та поза тілом і труднощами у засвоєнні навичок навчання та моторними дефіцитами.

Сенсорна інтеграція – це система відчуттів, які потім певним чином будуть використані. Дисфункція сенсорної інтеграції передбачає наявність ознак порушення центральної обробки вестибулярних, пропріоцептивних або тактильних відчуттів, які не можна пояснити значними ураженнями периферичної чи центральної нервової системи або спричинити когнітивні порушення. Фахівці з сенсорної інтеграції працюють з дітьми з різними діагнозами, такими як дитячий церебральний параліч, аутизм, Даун, затримка психомоторного розвитку, затримка мовлення тощо. Теорія сенсорної інтеграції, розроблена Е. Дж. Айресом (США), надихнула багато досліджень і мала більшу популярність, вплив на практику ерготерапії, ніж будь-яка інша теорія. Е. Дж. Айрес, ерготерапевт, розробив теорію сенсорної інтеграції, щоб пояснити зв'язок між порушенням інтерпретації відчуттів, що надходять зсередини та зовні тіла, і труднощами в навчанні навичкам навчання та руховими порушеннями. Цей напрямок розвивається з 60-х років ХХ століття, і суспільство все більше усвідомлює необхідність такої роботи.

У більшості людей сенсорна інтеграція відбувається автоматично, як серцебиття або перетравлення їжі.

Сенсорна інтеграція – це система відчуттів, які потім певним чином будуть використані. Відчуття дають нам інформацію про фізичний стан нашого тіла та навколишнього середовища. Відчуття є «їжею» нервової системи. Центральна нервова система, і особливо мозок, влаштовані таким чином, що можуть організувати незліченну кількість сенсорної інформації в цілісну систему. Коли відчуття протікають організовано, мозок може використовувати їх для формування сприйняття, поведінки та процесу навчання. Якщо діяльність сенсорних мереж добре впорядкована і мережі інтегровані одна з одною, тоді нервова система працює як єдине ціле. Об'єднуючу роль у цьому процесі відіграє вестибулярний апарат; всі інші відчуття обробляються з урахуванням його повідомлень. З усіх органів чуття вестибулярні рецептори є найбільш чутливими.

Ключові слова: *сенсорні системи, сенсорна модуляція, дисфункція праксису, ерготерапія, дитячий церебральний параліч.*

УДК 37.015.3 (075.8)

DOI <https://doi.org/10.32782/2663-6085/2024/77.17>

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Statement of the problem in general. Sensory integration begins in the womb when the fetal brain senses the movements of the mother's body. The child must develop sensory integration by interacting with the world around him in different ways. A review of the use of the term sensory integration yields a concerning number of references to sensory integration

that involve methods void of key occupational therapy principles, such as promoting an adaptive response and engagement in occupation [1, p. 3].

An adaptive response is a reasoned and purposeful response to sensations. Through adaptive responses we cope with problems and learn something new.

Sensations that tell us about the impact of the external world on the body (exteroceptors):

- visual image (vision)
- sound (hearing)
- taste (taste sensation)
- smell (smell)
- touch (touch)

Sensations that tell us about the position of the body in space and its movements:

- position and movement (proprioceptive sensations)
- gravity, head movements and body balance (vestibular sensations)
- Sensations that tell us what is happening inside the body (interoceptors)
- visceral sensations.

Main text. Sensory integration (sensory integration therapy) is a process during which the human nervous system receives information from the receptors of all senses, then organizes and interprets them so that they can be correctly and consistently used in purposeful activities. The interaction of all senses involves the systematization of stimuli and sensations in such a way that a person can adequately respond to certain stimuli and act based on the situation. In other words, this is an adaptive reaction that serves to perform a certain action, adopt an appropriate body position, etc. [1].

The diagnosis of “sensory integration dysfunction” implies the presence of signs of impairment of the central processing of vestibular, proprioceptive or tactile sensations, which cannot be explained by severe lesions of the peripheral or central nervous system or be caused by cognitive impairment. Sensory integration dysfunction is like a traffic jam in the brain. Often the development of a child with sensory integration disorder is unbalanced. Some areas of the nervous system work intermittently or incorrectly, while others perform their functions well, so in some ways the child's development will correspond to his age, but in others the child will lag behind.

Sensory integration dysfunction can manifest itself in two ways: weakness in modulation and weakness in praxis. A particular person may have one or both of these disorders.

1. Sensory modulation is the process of increasing or decreasing neural activity. There are usually four types of modulation disorders:

1. Sensory (including tactile) protection.
2. Gravitational uncertainty.
3. Intolerance to movement.
4. Hyporeactivity.

Sensory defense is a “fight or flight” response to sensations that others would consider completely harmless.

Gravitational uncertainty – manifests itself as a fear of moving when the body deviates from a vertical position and when the legs are off the ground.

Movement intolerance manifests itself in relation to those movements that would seem harmless to most people. Like gravitational uncertainty, movement intolerance is associated with weakened processing of vestibular information.

Hyporesponsiveness – While all of the sensory modulation disorders listed are associated with hyperresponsiveness, some individuals experience hyporesponsiveness. They react in ways that make it seem like they don't notice the sensation, or their reactions are much less intense than expected.

2. Dysfunction of praxis – in the theory of sensory integration, praxis is understood as the ability to plan new movements. We distinguish two levels of motor planning disorder: Bilateral integration (BIS) and somatodyspraxia.

BIS is related to vestibular and proprioceptive processes, somatodyspraxia is associated with the processing of both vestibular and proprioceptive information, as well as tactile information.

To evaluate children ages 4 to 9, sensory integration therapists use the Sensory Integration and Praxis Test (SIPT) to measure the efficiency of sensory processing and motor planning ability.

SIPT is often complemented by clinical neuromotor findings. We complement SIPT with clinical data reflecting the processing of vestibular and proprioceptive information.

The therapeutic process begins with the first meeting of the therapist with the client or his loved ones. The process then goes through several stages, including assessment, treatment planning, implementation, and completion. In Sensory Integration Therapy, the client is encouraged to engage in activities that highlight his weaknesses. Children with sensory integration disorders often intuitively choose precisely those types of activities that provide the brain with missing sensations and set motor tasks that help organize these sensations. Internal and external responses to sensory stimuli vary greatly among individuals [3].

Sensory integration disorder in cerebral palsy, which affects multiple sensory systems, involves the inability to effectively use and respond to sensations. The greatest sensory impairment in cerebral palsy is associated with lesions in the brain stem, which limits sensory experience due to the lack of normal motor control, leads to delayed suppression of primitive reflexes and slows motor development. It can also affect the child's ability to interpret sensations and use them to create meaningful representations needed for learning and motor planning.

The opposite situation is observed in children with decreased sensitivity to vestibular functions. Such a child needs circular games involving swinging or turning, in which balls, logs or ladders can be used. The World Health Organization has defined participation as “involvement in life situations” [5, p. 10].

When working with children with reduced or increased tactile sensitivity, a defectologist may observe the manifestation of negative emotions during tactile contact. In this case, with each touch, the teacher-defectologist is obliged to warn the child about his intentions and focus the work on the play method with sand, paints and other tools. Then gradually move on to touching various materials and textures, as well as sensory mats, which will help the child stop being afraid of touch.

In particular, it should be emphasized that in extreme conditions, war and natural disasters, taking into account that children are a vulnerable group, it is necessary to formulate and apply these pedagogical procedures according to those conditions. For this, the experience of a number of countries such as Ukraine and Azerbaijan is of particular importance [4].

Conclusions and prospects for further research. Ayres recommended conducting classes with the child 2–3 times a week. Suspension equipment and suitable practice space are required to enable the client to participate in activities that provide enhanced sensations.

For Azerbaijan, this method is an innovation. An individual approach is applied to each child. Each child undergoes a special SIPT test and an individual treatment plan is created. Classes are held for 30–40 minutes in a specially equipped room.

Corrective work, based on the principles of sensory-integrative theory, is a powerful tool with which you can change a client's life.

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