

Definition of Integrative Sensory Neurotherapy as a therapeutic innovation for holistic well-being

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ABSTRACT

Introduction: Currently, the world population is overwhelmed by pharmaceutical products of different types and brands, leading to an increase in adverse effects. As a result, many people are seeking more natural and holistic alternatives to restore their biopsychosocial balance, beyond the current fragmented approach to treating the health-disease process. **Objective:** to define Integrative Sensory Neurotherapy as a therapeutic innovation for comprehensive well-being. **Methods:** a systematization of the literature was carried out in order to find the regularities and differences between the terms that precede the one proposed to be defined in this article. Through the application of theoretical methods, the theoretical foundations that provide scientific validity to the definition were identified. **Results:** A study was conducted of the existing definitions in the literature on the critical issues related to the subject; problematic situations and a contradiction were identified. Taking into consideration the traditional definition of Neurotherapy, another approach was taken that allowed it to be defined for the current context. This progressive analysis made clear the need for a new definition of Integrative Sensory Neurotherapy for the already defined scenario, establishing its similarities and differences with Ayres' Sensory Integration Theory. **Conclusion:** The Integrative Sensory Neurotherapy was defined as a therapeutic innovation for comprehensive well-being.

Keywords: Neurotherapy; Sensory Neurotherapy; Neuroscience; Sensory Neuroscience; Traditional and Complementary Medicine; Integrative Medicine; Sensory; Holistic; Integrative; Multisensory; Comprehensive Well-being; Biopsychosocial Well-being; Interdisciplinarity.

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Definición de Neuroterapia Sensorial Integrativa como innovación terapéutica para el bienestar integral

RESUMEN

Introducción: en la actualidad, la población mundial es presa de una sobre carga de productos farmacéuticos de diferentes tipos y marcas; de manera tal que existe un aumento de los efectos adversos, y no son pocos los que buscan alternativas más naturales y holísticas para restaurar su equilibrio biopsicosocial, más allá del enfoque fragmentado actual en el tratamiento del proceso salud enfermedad. **Objetivo:** definir la Neuroterapia Sensorial Integrativa como innovación terapéutica para el bienestar integral. **Métodos:** se realizó una sistematización de la literatura con el fin de encontrar las regularidades y diferencias entre los términos que preceden al que se propone definir en el actual artículo. Mediante la aplicación de métodos del nivel teórico se identificaron los fundamentos teóricos que brindan cientificidad a la definición. **Resultados:** se realizó un estudio de las definiciones existentes en la literatura sobre los nudos críticos relacionados con la temática; se identificaron situaciones problemáticas y una contradicción. Tomando en consideración la definición tradicional de Neuroterapia, se le dio otro enfoque que permitió definirla para el contexto actual. Este análisis progresivo dejó claro la necesidad de una nueva definición de Neuroterapia Sensorial Integrativa para el escenario ya definido, al establecer sus semejanzas y diferencias con las Teoría de Integración Sensorial de Ayres. **Conclusión:** Se realizó la definición la Neuroterapia Sensorial Integrativa como innovación terapéutica para el bienestar integral.

Palabras clave: Neuroterapia; Neuroterapia Sensorial; Neurociencias; Neurociencia sensorial; Medicina tradicional y complementaria; Medicina integrativa; Sensorial; Holístico; Integrativo; Multisensorial; Bienestar integral; Bienestar biopsicosocial; Interdisciplinariedad.

Définition de la neurothérapie sensorielle intégrative comme innovation thérapeutique pour le bien-être global

RÉSUMÉ

Introduction : actuellement, la population mondiale est victime d'une surconsommation de produits pharmaceutiques de différents types et marques, ce qui entraîne une augmentation des effets indésirables. Nombreux sont ceux qui recherchent des alternatives plus naturelles et holistiques pour rétablir leur équilibre biopsychosocial, au-delà de l'approche fragmentée actuelle dans le traitement du processus santé-maladie. **Objectif :** définir la neurothérapie sensorielle intégrative comme une innovation thérapeutique pour le bien-être global. **Méthodes :** une systématisation de la littérature a été réalisée afin de trouver les régularités et les différences entre les termes qui précèdent celui que nous proposons de définir dans le présent article. Grâce à l'application de méthodes théoriques, les fondements théoriques qui confèrent un caractère scientifique à la définition ont été identifiés. **Résultats :** une étude des définitions existantes dans la littérature sur les points critiques liés au sujet a été réalisée ; des situations problématiques et une contradiction ont été identifiées. En tenant compte de la définition traditionnelle de la neurothérapie, une autre approche a été adoptée, qui a permis de la définir dans le contexte actuel. Cette analyse progressive a mis en évidence la nécessité d'une nouvelle définition de la neurothérapie sensorielle intégrative pour le scénario déjà défini, en établissant ses similitudes et ses différences avec la théorie de l'intégration sensorielle d'Ayres. **Conclusion :** La neurothérapie sensorielle intégrative a été définie comme une innovation thérapeutique pour le bien-être général.

Mots clés : Neurothérapie ; Neurothérapie sensorielle ; Neurosciences ; Neuroscience sensorielle ; Médecine traditionnelle et complémentaire ; Médecine intégrative ; Sensoriel ; Holistique ; Intégratif ; Multisensoriel ; Bien-être global ; Bien-être biopsychosocial ; Interdisciplinarité.

Definição de Neuroterapia Sensorial Integrativa como inovação terapêutica para o bem-estar integral

RÉSUME

Introdução: atualmente, a população mundial está sobrecarregada por produtos farmacêuticos de diferentes tipos e marcas, o que tem provocado um aumento nos efeitos adversos. Por isso, muitos buscam alternativas mais naturais e holísticas para restaurar seu equilíbrio biopsicossocial, indo além da abordagem fragmentada atual no tratamento do processo saúde-doença. **Objetivo:** definir a Neuroterapia Sensorial Integrativa como uma inovação terapêutica voltada para o bem-estar integral. **Métodos:** foi realizada uma sistematização da literatura com o objetivo de encontrar regularidades e diferenças entre os termos preexistentes relacionados à proposta de definição apresentada neste artigo. Por meio da aplicação de métodos de nível teórico, foram identificados os fundamentos que conferem cientificidade à definição. **Resultados:** foi realizado um estudo das definições existentes na literatura sobre os pontos críticos relacionados ao tema; identificaram-se situações problemáticas e uma contradição. Considerando a definição tradicional de Neuroterapia, foi adotada uma nova abordagem que possibilitou redefini-la para o cenário atual. Essa análise progressiva evidenciou a necessidade de uma nova definição de Neuroterapia Sensorial Integrativa, estabelecendo semelhanças e diferenças com a Teoria de Integração Sensorial de Ayres. **Conclusão:** foi definida a Neuroterapia Sensorial Integrativa como uma inovação terapêutica voltada para o bem-estar integral.

Palavras-chave: Neuroterapia; Neuroterapia Sensorial; Neurociências; Neurociência sensorial; Medicina tradicional e complementar; Medicina integrativa; Sensorial; Holístico; Integrativo; Multissensorial; Bem-estar integral; Bem-estar biopsicossocial; Interdisciplinaridade.

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INTRODUCTION

According to the World Health Organization (WHO), health is defined as "a state of complete physical, mental and social well-being, not only the absence of conditions or diseases"; this vision, established in 1948, is a first approach to integral health.(1,2) Neuroscience is one of the areas of knowledge that also relates to human health. Studies the Nervous System and is responsible for understanding behaviors, thoughts, creativity, emotions and dissimilar bodily functions; from the deep understanding of the organization of each of the structures that make up this system, its development and functions. (3)

The scientific literature recognizes within this discipline to sensory neuroscience, responsible for studying the reception, processing and interpretation of information by the nervous system, which comes from the different senses, namely: vision, hearing, taste, touch, smell and proprioception (movement).(3) In educational and therapeutic settings, using the multisensory approach promotes adaptation to different individual needs and preferences, which clearly contributes to improved cognitive development, memory, self-regulation and inclusion. In addition, this practice has been shown to benefit patients in rehabilitative neurotherapy, as it promotes brain plasticity and favors the integration of cognitive and motor functions. (4)

The terms holistic, integral and integrative are of great importance in modern times; but they differ in their approach and application. In summary, the holistic refers to the philosophy of considering the totality of being; the integral to the coverage and breadth of the approaches; and the integrative to the ability to merge and interrelate various disciplines and techniques for the benefit of the patient. (5) By understanding the terms stated above, it is understood that the definition of health in 1948, in the opinion of the authors, does not respond to the integrality of the human being with their current needs. This is why the definition of biopsychosocial well-being is not sufficient for the present research.

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In 2017, the WHO approved the term "Traditional, Complementary and Integrative Medicine" (TCM) (9) as a response to the current need for holistic, comprehensive and integrative treatment. On May 14, 2025, said organization presents the Global Strategy Project on Traditional Medicine 2025-2034, in 78^a World Health Assembly, where the following is raised: "In view of the complexity of the MTCI and its multidisciplinary nature, rooted in different philosophies, relevant research methodologies and modalities relating to intellectual property law should be used, and there should be collaboration between experts in methodology and practice, as well as between researchers in the field of MTCI and other researchers." (9)

The WHO recognizes in this strategy that it is imperative to safely, effectively and ethically integrate traditional medicine into modern health models, in order to respond to the realities of the growing population around the world; because they are beings that resort to these practices especially where biomedicine is difficult to access or in those pathologies for which biomedicine is not effective." (10) Scientific studies show the effect of this type of therapies to achieve balance in the health-disease process, as it is a complement to conventional medicine. (11-14) However, there is a growing need for individuals to eliminate defragmentation in their attention process supported by the development of science and technological innovation. Integrative Sensory Neurotherapy is a response to the call of the WHO.

Hence the purpose of this publication is analyzing the need for Integrative Sensory Neurotherapy and define it as a therapeutic innovation for comprehensive well-being.

METHOD

Theoretical level method

Analytical-synthetic: it was used to delve deeper into the specialized literature as an essential aspect in the formation of the theoretical framework of the research, related to the therapeutic process of Integrative Sensory Neurotherapy for comprehensive well-being; also, in the analysis of the results of the application of empirical methods

Historical-logical: this was used to determine the main historical background and trends that have characterized the evolution of the subject of study,

and how its development affects Sensory Neurotherapy.

Systematization: to identify trends and essential features in the treatment that national and international researchers give to the subject of research and the field of action.

Functional structural systemic: served to establish regularities in relation to Sensory Neurotherapy. It favored the organization of knowledge in each chapter and in the headings, by establishing the necessary interrelationships, in such a way that the dialectical and changing conception of the object is expressed as a result of the transformative activity and its relationship with the environment. It also allowed the structure and components of the model to be schematized.

Inductive-deductive: it was used to reflect on the considerations of different authors related to the topic, and subsequently reach conclusions about the general characteristics of holistic model of Integrative Sensory Neurotherapy as a therapeutic innovation for comprehensive well-being.

P To address this topic within the context of Medical and Life Education, the Adaptive Synergistic Paradigm is adopted. (15)

RESULTS

From the interdisciplinary relationship between neuroscience, psychology, occupational therapy and numerous complementary approaches that explore the role of the senses in the well-being and neuropsychological regulation of the human being, is born the Sensory Neurotherapy. (16-18) In its beginnings it was inspired by pioneering contributions to sensory integration, such as the conceptualization of Ayres and its evolution into occupational therapies. (19) In addition, Sensory Neurotherapy has been part of the recent advances in sensory stimulation, (20,21) emotional integration (22-24) and neuroplasticity, (25) consolidating a paradigm that goes beyond symptomatic intervention to favor integral biopsychosocial development.

In recent years, there has been a transition towards increasingly integrative and innovative models, where the discipline has overcome the traditional empirical support to adopt evidence-based sensory stimulation methods, and the implementation of emotional regulation approaches for addressing various conditions, from chronic pain to neurodevelopmental pathologies and psychiatric conditions.(26-31) In this respect, sensory integration therapy is recognized as the "treatment method created by Dr Jean Ayres (1972) to detect and assess sensory needs, facilitating adaptive responses in different

circumstances and environments. Provides control of sensory input so that the child spontaneously integrates these sensations to form adaptive responses."(19,32-34) In his theory, Ayres postulated that sensory integration is fundamental for motor planning, learning and adaptive behavior. He also described sensory integration dysfunction as a failure in the organization of information within the central nervous system, resulting in difficulties in generating appropriate responses to stimuli. (35,36)

This definition is considered the classic and foundational standard in the literature on sensory integration. The classic textual quote by Jean Ayres (1972) that defines sensory integration is: "*The neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment.*" (32,37,38) The commonly used translation into Spanish is "The neurological process that organizes the sensation of one's own body and environment, and that makes it possible to use the body effectively in the environment."(39-41)

Another of the interrelated constructs is sensory neurotherapy, referring to interventions that use controlled stimulation of the sensory systems in order to induce functional changes in brain activity and improve clinical and cognitive self-regulation, Findings supported by neurofeedback studies and therapies based on non-invasive neural stimulation.(42) The holistic approach mentioned above is a perspective that demands interdisciplinarity, understood not only as collaboration between different areas of knowledge, as a synthesis of knowledge that allows complex phenomena in health and education to be addressed more effectively.(43)

By reviewing all the previous definitions in the systematization carried out, it can be clearly identified that they all focus on the rehabilitation of the nervous system, after an acute or chronic illness. However, in this research problematic situations and a contradiction are addressed, with a different approach than what has been reflected in the literature that the researchers have been able to analyze, and which leads them to assume a different definition of Neurotherapy limited to the scenario. current, which is described below.

The lead author's experience as a physician, therapist, academic, and researcher enabled her to identify the following problematic situations in addressing comprehensive well-being: there is fragmentation of health services, with disconnected interventions between the biological, psychological, social, cultural, and environmental

aspects of the individual's surroundings and social determinants; reductionist models focused solely on disease prevail, so accessible and sustainable models are needed; there is a lack of real interdisciplinary work; attention is insufficiently personalized; there are difficulties in addressing stress, trauma, and emotional well-being, among other reasons, that medical curricula often offer limited training in non-pharmacological strategies for emotional regulation, resilience, and self-care.

Furthermore, the development of communication skills and holistic empathy is limited, since no special attention is paid to extra-verbal language; There is a gap between Neuroscience and the daily Clinic, and its effective teaching in the curriculum remains a challenge; and the limited integration of scientific and technological innovations in clinical practice. All of this reduces the effectiveness of interventions and perpetuates deficiencies in people's comprehensive care.

Despite advances in science and technology, as well as conceptual progress promoting comprehensive health models, a fundamental contradiction persists in practice: while academic discourse and public policies recognize the need to care for human beings holistically, most health systems and services work in a fragmented manner, with isolated interventions that address biological, psychological, social, cultural, and environmental aspects separately. This disconnection between theory and practice limits therapeutic effectiveness, reinforces disciplinary segmentation, and perpetuates gaps in comprehensive wellness care.

In this context, a comprehensive, multidimensional, and personalized approach to neurotherapy is necessary, unlike the classic definition focused on neurorehabilitation. At this point, the lead author is able to define **Neurotherapy in the current context**, understood as an integrative, holistic, and participatory discipline that transcends the traditional approach to sensory rehabilitation by employing the conscious and protocolized administration of physical, sensory, and natural stimuli on specific or reflex areas of the body to modulate neuronal activity, enhance neuroplasticity, and promote comprehensive well-being through personalized resources and strategies based on scientific evidence, with humanism and ethics.

One of the characteristics of Neurotherapy in this context is that it incorporates energetic, sensory, biochemical, or natural resources (such as heat, light, sound, texture, color, aroma, sensory mindfulness, pressure, medicinal plants, and

narrative exercises) to stimulate the central and peripheral nervous systems based on neuroscientific principles and personalized strategies. Another feature is that it can be used both to restore function after injury or illness and to optimize overall well-being and resilience in healthy people. Its approach can be technological, natural, integrative, or holistic, depending on the method used and the personalized clinical or preventive context.

The definition of Neurotherapy for the current context differs from Ayres' traditional definition in the following ways: the classic definition usually focuses on medical technologies (neurofeedback, electrical, magnetic, or chemical stimulation for controlling symptoms or neural dysfunctions). The current vision broadens the field by incorporating natural sensory resources and the holistic dimension of well-being (not just disease treatment), emphasizing awareness, self-observation, and the integration of natural resources into the protocol.

In the current context, "neurotherapy" is no longer just a medical or technological technique, but is understood as an integrative and personalized range of interventions based on neuroscience, sensorially, and natural health for human regulation and integral development. It explicitly includes the integrative and holistic dimension (bio-psycho-social-spiritual, emotional, cultural, and environmental), which many conventional definitions overlook by focusing on neurotechnology or conventional medicine.

The possibility of applying personalized and combined protocols is recognized, to modulate not only the nervous system but also the personal and social experience of well-being. It considers intervention in both clinical pathologies and prevention, health promotion, and human development. It incorporates the Socratic approach, which adds a philosophical and reflective dimension to the neurotherapeutic process (an innovative feature of this proposal).

However, it has *similarities* with existing definitions: it seeks to stimulate the nervous system to alter neuronal activity and promote neuroplasticity (neuromodulation). It recognizes its application to emotional, cognitive, behavioral, and physical disorders and its role in rehabilitation and well-being. It is based on the concept of neuroplasticity and individual therapeutic modulation.

Thus, Integrative Sensory Neurotherapy emerges as a structured field, in constant technological and conceptual evolution, which raises a systemic approach, protocolized and adapted to

contemporary realities in mental health and human wellness. From the current perspective or context, this discipline aims to overcome reductionist models in a holistic and well-founded manner, applying natural resources and scientific strategies to link the biological, psychological, social, emotional, spiritual, cultural, and environmental aspects, promoting truly holistic and personalized care, focused on comprehensive regulation and sustained human development.

It is a therapeutic discipline with a scientific and artistic basis, with its own characteristics, resources, and objectives, clearly differentiated and named; it reinforces methodological innovation, the relationship with evidence, and the personalization of the sensorial approach for the current global context, recognized in this research as the current Context. Neurotherapy in this context is a broad definition, a general framework, unlike Integrative Sensory Neurotherapy, which is the theoretical-methodological discipline to be developed in this doctoral research process, as an innovative proposal that differs from existing trends.

Already at this point, the main author is in a position to define ***Integrative Sensory Neurotherapy*** (ISN) *as a therapeutic discipline and a scientifically based art, focused on the regulation, re-education and optimization of the nervous system through natural and conscious sensory stimulation, using pathways such as touch, temperature, color, sound, aroma and texture in personalized protocols; It is supported by neuroplasticity, by integrating natural resources and emotional neuroscience, to promote psychophysiological balance, emotional regulation and integral human development, in coherence with natural medicine, evidence and reflective self-observation.*

This definition presents some similarities with classic definitions (Ayres/technological), and is that it coincides in the use of sensory stimulation and neuromodulation (such as Ayres sensory integration and neurofeedback therapies); (19,44) recognizes the importance of neuroplasticity as a

central principle. It addresses sensory processing as a key to development, learning and behavioral adaptation;(45) it is supported by the organization of the senses and the adaptive response to the environment.

DISCUSSION

Below, table 1 is presented with the differences between them, where it can be seen that ISN expands, integrates and transcends classical therapy, adding natural resources, reflective awareness, holistic approach and a methodology aimed at comprehensive development, not only treatment. of sensory difficulties.

ISN is considered a discipline because it has a theoretical framework and clear and rigorous foundations supported by neuroscience, neurobiology, among others. In addition, it has pillars and principles, structured in a systematic application method that seeks effectiveness and replicability in its results. But as seen in the definition, it is also an art, because the success of the therapies that comprise it depends on the skill, intuition and creativity of the therapist to apply the principles of this discipline and the designed Socratic approach. How sensory and narrative therapies are combined, and how they adapt to each person's unique needs, is a skill that goes beyond simple protocol. The therapeutic relationship and the human connection that is established are crucial elements that cannot be quantified or replicated exactly, and are a pillar of its practice.

It constitutes an academic-scientific discipline because it articulates its own theoretical corpus, methodological principles, development objectives, scientific bases and a structured method that guides training, practice and innovation in the therapeutic and educational field. As a discipline, it delimits its epistemological field, intervention criteria, classification of techniques and protocolization, allowing the production of knowledge, the systematic evaluation of results and specialized professional training.

Cuadro 1. Comparison between classical Sensory Integration Therapy (Ayres) versus Integrative Sensory Neurotherapy (ISN)

Characteristics	Classic Sensory Integration	Integrative Sensory Neurotherapy (ISN)
Resources used	Structured equipment and stimuli	Natural resources (plants, oils, heat, color, sound, texture)
User/participation	Active in games and exercises	Active, conscious, reflective, process protagonist
Focus	Rehabilitation of sensory functions	Psychophysiological regulation, comprehensive well-being, human development
Scientific basis	Neurophysiology of sensory processing	Sensory and emotional neuroscience, natural medicine, holistic approach
Aplicacation	Children with sensory disorders	People of any age seeking comprehensive well-being
Reflective dimension	Low/outsourced	Elevated; self-observation and therapeutic co-construction
Personalization	Standard structured programs	Highly personalized protocols

Source: own elaboration

It is also an *art* because it requires sensitivity, creativity, intuition and adaptability in practical application, favoring a deep and personalized connection between therapist and consultant. Working with the senses, narratives and multisensory experiences implies a subjective, aesthetic and relational component, where the ability to create environments, intervene with innovative resources and accompany processes of human transformation transcends the merely technical.

In summary, this duality is expressed in the knowledge provided by the discipline and art with which that knowledge is applied in an effective and personalized way. It is an integrative discipline and authentic therapeutic that requires both scientific rigor and creative mastery, by combining analysis, protocolization and openness to experience. And it is a relational-creative art because its effectiveness and uniqueness depend deeply on the creativity, empathy and ability of the therapist to build meaningful relationships and adapt to the uniqueness of each individual or context. See image 2 in the annex, where the fusion and dialogue between discipline and art is represented

CONCLUSIONS

The definition of the Integrative Sensory Neurotherapy to be defined as a therapeutic innovation for comprehensive well-being was done.

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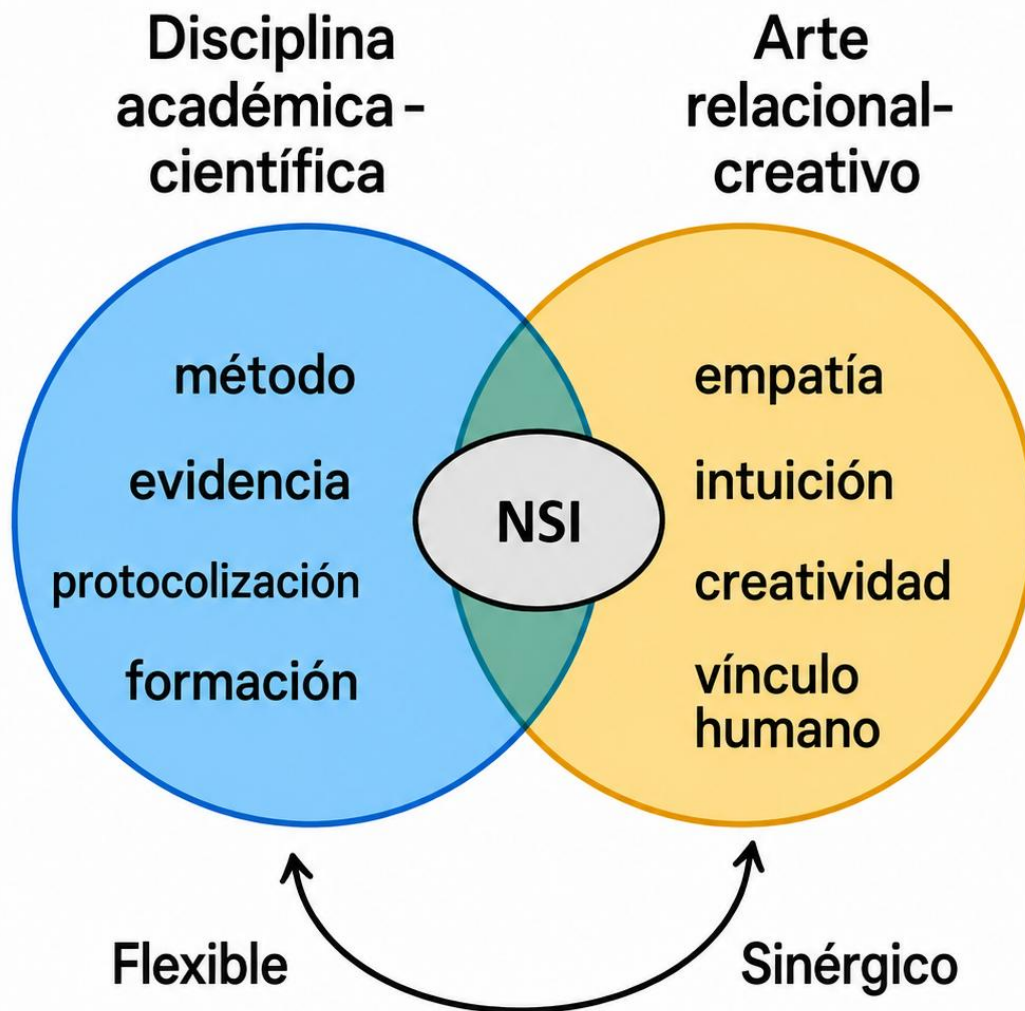
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ANNEX

Supporting images

Image 1.

Scheme of the ISN as the fusion and dialogue between discipline and art.



Source: Image generated by ChatGpt IA + Elaboración propia

Conflict of interest

The author declares that there are no conflicts of interest between them, nor with the research presented.

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