Clin. Pract. Epidemiol. Ment. Health
DOI: 10.2174/0117450179462316260908052738, 2026, 22, e17450179462316
ISSN: 1745-0179
1

COMMENTARY OPEN ACCESS

Executive Functions and Conceptual Models: A First Look at a Complex Topic: Commentary

Donatella Rita Petretto[1,*]

[1]*Department of Education, Philosophy, Psychology, University of Cagliari, Cagliari, Italy*

Abstract:

Background: Since the late 19th century and over the last decades, executive functions (EF) have received increasing attentionin neuropsychology and clinical psychology for their influence on various domains of functioning, activities of daily living, and various psychological and mental disorders.

Methods: In this commentary, we aim to describe the major theoretical models of EF, their structures, clinical implications, with a focus on some neurodevelopmental disorders and major neurocognitive disorders.

Results: Two main approaches emerge: unitary models (*e.g.*, Stuss and Benson, Norman and Shallice, Lezak) view EF as an integrated self-regulatory system, while multi-component models (*e.g.*, Miyake, Diamond, Zelazo) describe separable but interconnected processes such as inhibition, working memory, and cognitive flexibility. In individuals with some neurodevelopmental disorders and major neurocognitive disorders, EF may be impaired (while sometimes only some EFs are affected, in other situations, all EFs are negatively influenced).

Discussion: Contemporary EF theoretical models integrate unitary and multi-component perspectives. They describe EF as coordinated yet distinguishable control processes. Looking at some clinical conditions, such as neurodevelopmental disorders and major neurocognitive disorders, both unitary and multi-component perspectives are supported: in some specific clinical conditions, specific processes and/or modules of EF may be selectively impaired. There is still an open debate on the role of EF as a transdiagnostic feature.

Conclusion: Executive functions represent a fundamental domain for understanding adaptive behaviour across the lifespan. Future research should further clarify the relationships among executive subcomponents, their neural mechanisms, and their role across psychological and neurological disorders, thereby contributing to more refined theoretical models and more targeted clinical assessment and rehabilitation strategies, as well as their role as a transdiagnostic construct.

Keywords: Executive functions, Cognitive control, Self-regulation, Theoretical models, Neurodevelopmental disorders, Major neurocognitive disorders.

*Address correspondence to this author at the Department of Education, Philosophy, Psychology, University of Cagliari, Cagliari, Italy; E-mail: drpetretto@unica.it

Cite as: Petretto D. Executive Functions and Conceptual Models: A First Look at a Complex Topic: Commentary. Clin Pract Epidemiol Ment Health, 2026; 22: e17450179462316. http://dx.doi.org/10.2174/0117450179462316260908052738

Received: January 07, 2026
Revised: February 20, 2026
Accepted: March 18, 2026
Published: September 11, 2026

1. INTRODUCTION

Since the late 19th century, executive functions (EF) have received increasing attention for their influence on everyday life and on various domains of functioning (including educational, academic, and occupational contexts). In general, executive functions are described as a set of higher-order cognitive processes that enable individuals to define goals, plan and execute strategies,

regulate their behavior, adapt to environmental changes, and control their emotions [1-3]. Over the years, various authors have contributed to defining and describing the EFs [4-12].

Although interest in these functions has progressively increased, some theoretical questions remain open: How many executive functions are there? Are they a unitary function or a complex set of interrelated processes? From a clinical point of view, should they be considered as a transdiagnostic construct, present across various psychological and mental disorders (such as neurodevelopmental and major or minor neurocognitive disorders), or are specific EFs involved in specific disorders?

This commentary aims to discuss some of these topics, starting from theoretical definitions and then addressing their clinical role in specific psychological and mental disorders.

1.1. Conceptual Models

During the 20th century, executive functions were studied starting from their neuroanatomical bases, particularly the frontal lobe, and they were referred to as "frontal lobe functions" [4, 5]. Only later did the term "executive functions" appear, and a more articulated conceptualization of executive functions was developed.

The well-known clinical case of Phineas Gage can be considered an important starting point for the study of executive functions [6]. In 1848, Phineas Gage had a serious workplace accident in which an iron rod penetrated his skull; the iron rod destroyed a large portion of his medial frontal lobe (bilaterally). He survived but, as his physician claimed, Gage "was no longer Gage": his basic cognitive abilities remained intact, but his personality and his capacity for planning and self-control were profoundly compromised [6].

Some years later, other clinical reports were proposed. Damasio [6] described the experience of Elliott, a man who, after the surgical removal of a meningioma in the frontal region, showed preserved general cognitive abilities but a severe inability to make appropriate decisions, regulate his emotions, and organize daily life.

In the 1980s, Stuss and Benson [4] provided a detailed description of frontal functions, defining them as a set of cognitive and behavioral abilities; they also described the domains regulated by frontal mechanisms. The authors highlighted the role of frontal lobe integrity in the coordination of those cognitive and mental functions. According to these authors, the frontal lobe and the EF act as a kind of "conductor of the orchestra," which integrates information from different cognitive systems and directs behavior toward complex goals.

In the same years, Norman and Shallice [5] developed a cognitive model of executive control, the so-called Supervisory Attentional System (SAS). They used the SAS to describe how individuals manage novel, complex, or even conflicting situations that cannot be handled through automatic behavioral routines.

Since the 1980s, Lezak has addressed executive functions and proposed an approach to be used both in clinical and rehabilitative contexts [7]. According to Lezak, executive functions comprise four fundamental processes: goal formulation, planning strategies, execution of goal-directed actions, and monitoring of results with possible correction [7].

Some years later, Miyake and colleagues [8] proposed a model of executive functions based on three core components: updating, shifting, and inhibition. Updating refers to the ability to refresh and replace information held in working memory according to task demands. Shifting concerns the capacity for cognitive flexibility, that is, the ability to switch between tasks or strategies. Inhibition refers to the suppression of automatic or dominant responses that are inappropriate to the current situation. This model has had a major impact because it enabled the study of executive functions using rigorous experimental methods, demonstrating that these components are interrelated yet separable. The authors described this mixed structure of EF, and they referred to it as the "unity and diversity model" [8, 13-16].

In the same years, similarly to Miyake and colleagues'model [8], Diamond [9, 10] developed a developmental model of executive functions; she highlighted the role of the three core executive functions (inhibition, working memory, and cognitive flexibility) during the various phases of life; moreover, she described environmental and relational/social factors that may influence EF (quality of educational experiences, social relationships, stress levels, and physical activity) [9, 10].

In the same years, Philip Zelazo [11, 12, 17, 18] described executive functions as processes that are constructed and transformed across the lifespan, in close connection with and influenced by relational experiences and educational practices. According to his framework, executive functions are deeply tied to reflective and metacognitive capacities, and he highlighted the role of emotions and social interactions in their development. He was the first to introduce the distinction between cognitive and socio-emotional dimensions, proposing the distinction between "hot" and "cool" executive functions [17]. In Zelazo's model, "cool" executive functions refer to abstract, decontextualized cognitive processes (cognitive flexibility, working memory, and planning) that are typically activated in emotionally neutral contexts. In contrast, "hot" executive functions operate in situations with a high emotional or motivational load, involving impulse regulation, delayed gratification, and modulation of affective responses. Zelazo points out that these dimensions, while interacting, may develop at different rates, thereby influencing self-regulation, learning, and behavioral adaptation [17, 19].

Recently, Diamond defined EFs as a "*family of top-down mental processes that make it possible for us to pay attention and stay focused; reason and problem solve; exercise choice, discipline, and the self-control to avoid being impulsive, rash, or reacting without thinking; see things from different perspectives; mentally consider*

alternatives, see how different ideas or facts relate to one another, and reflect on the past or consider an imagined future; and flexibly adjust to change or new information" [20, p. 225].

The models described thus far highlight two main theoretical perspectives, and they can be divided into two main groups, with some overlaps. The first group proposed a unitary view of EFs: for example, Lezak's model [7]described executive functions as an integrated cycle of self-regulation. The second group proposed a multicomponent view, as seen in the models of Miyake and colleagues [8], Diamond [9, 10], and Zelazo [17], which interpret executive functions as a set of distinct yet interconnected components. Moreover, together, all those models also reveal a distinction between process-oriented models [5]; Lezak [7]) and modular models (*e.g.*, Miyake and colleagues [8], Diamond [10], Zelazo [17]. Each of these theoretical frameworks contributes to our understanding of different facets of executive functioning: Stuss and Benson [4] emphasized the neuroanatomical dimension; Norman and Shallice [5] introduced a cognitive framework for voluntary control; Lezak [7] focused on clinical implications of executive functions; Miyake and colleagues [8] provided an experimental and empirical structure; Diamond ~~(2013)~~ [10] focused on development, education and intervention; and Zelazo ~~(2012)~~ [6] highlighted the role of emotional dimensions.

1.2. The Clinical Role of Executive Functions in Neurodevelopmental Disorders and Major Neurocognitive Disorders

The clinical significance of executive functions is evident not only in cases of frontal lobe lesions, but also across various psychological/mental disorders. Their clinical role is broad and multifactorial, as executive functions play a crucial role in ensuring adaptive functioning in everyday life. Their impairment may manifest as difficulties in attentional control, inhibition of automatic responses, working memory, strategic planning, and cognitive flexibility, with significant repercussions for an individual's functioning and adaptation in learning, social, and occupational settings. In the following sections, we specifically address the role of EFs in some neurodevelopmental disorders and some major and minor neurocognitive disorders.

Some previous and recent research has shown that children with specific learning disorders (SLD) often present EFs' impairments, primarily in working memory but also in processing speed, long-term memory, and narrative abilities [21-23]. Working memory is essential for maintaining and manipulating temporary information; it is often impaired in children with SLD, making it difficult to integrate information during reading, writing, or mathematical problem-solving [21, 22]. Similarly, reduced processing speed may limit the ability to complete complex tasks efficiently, leading to cognitive overload and frustration [21, 22]. These deficits may interfere with activities in school activities and other activities of daily living. In adolescents and adults with specific learning disorders, EF difficulties may appear in different but equally significant forms. Prospective memory, the ability to remember to perform intended actions in the future, is often impaired, with practical consequences such as forgetting appointments, deadlines, or planned activities [24, 25]. Time management, closely linked to planning and goal prioritization, may also be inefficient, leading to reduced productivity and increased stress. Working memory continues to play a critical role in adulthood, influencing the ability to retain relevant information while solving complex problems or managing multiple tasks simultaneously [24, 25]. These deficits may interfere with occupational functioning and other activities of daily living.

In older adults with major and minor neurocognitive disorders, EFs are central to maintaining autonomy and quality of life, and their decline is frequently observed in both major and minor neurocognitive disorders [26, 27]. These disorders represent a heterogeneous group of syndromes characterized by progressive cognitive decline in various domains of functioning that interferes with daily functioning and personal independence. Among the various cognitive domains affected, EFs are particularly affected, exhibiting patterns of deficit that vary depending on the specific type of neurocognitive disorder [26, 27].

In major neurocognitive disorder due to Alzheimer's disease, initial impairment primarily affects episodic memory, yet EF difficulties - particularly in planning complex actions, cognitive flexibility, and behavioral monitoring and correction - often emerge in the early stages. These deficits interfere with everyday activities such as meal preparation, financial management, and scheduling tasks [27-32].

Frontotemporal major and minor neurocognitive disorders display a distinct cognitive profile. In these conditions, executive dysfunction represents the predominant symptom from the earliest phases of the disease. People with frontotemporal major neurocognitive disorders may exhibit impulsivity, deficient inhibitory control, rigid thinking, and an inability to adapt behavior to environmental demands [33, 34]. Such alterations reflect the involvement of prefrontal regions, which are responsible for the regulation of executive processes, and profoundly affect an individual's social and relational functioning.

In major neurocognitive disorder due to Lewy Body disease (LBD), EFs may be affected early in the onset of the disorder [27]. Individuals with LBD may show difficulties with planning, problem solving, and cognitive flexibility, which influence their ability to adapt to changes or manage complex tasks. In individuals with LBD, attention and alertness tend to fluctuate, with periods of confusion alternating with clearer moments [35]. Impulsive responses or repetitive behaviors are common due to poor inhibitory control. Working memory is also impaired, affecting the capacity to store and manipulate information. These problems are linked to dysfunction in fronto-striatal circuits and prefrontal regions. Compared with Alzheimer's disease, LBD typically shows greater

executive dysfunction but relatively better episodic memory [27]. Executive difficulties have an important impact on the patient's independence and daily functioning [27, 36].

The executive difficulties observed in neurodevelopmental disorders and major neurocognitive disorders described thus far highlight two main patterns: while EFs are impaired in all the described disorders, some EFs could mya be more severely affected that other depending on the specific disorders, with different effects during different phases of life within the same disorder. Looking at these clinical conditions, both unitary and multi-component perspectives on EFs are supported.

2. DISCUSSION

In recent decades, EFs have received increasing attention in neuropsychology for their importancein clinical contexts and for their influence on various life contexts (such as educational, social, and occupational domains) and on activities of daily living [1-3]. In this paper, we discussed the major theoretical models that have been developed and identified two main perspectives: one based on a unitary construct of EFs and one based on multicomponent views of EFs. Unitary models, such as the one proposed by Lezak [7], emphasize the integrative and coordinating role of executive functions. In contrast, multi-component approaches, such as those proposed by Miyake [8], Diamond [10, 12], and Zelazo [12], focus onthe identification of specific subprocesses (inhibition, working memory, cognitive flexibility, and updating). Moreover, in recent decades, some authors have highlighted the need to integrate these two different perspectives into a new coherent framework: although executive functions are composed of distinct components, they share the common goal of supporting behavioral regulation and adaptive functioning. A similar debate on unitary models and multicomponent models of EFs emerges from a clinical point of view, on some neurodevelopmental disorders and major neurocognitive disorders, . EFs are negatively influenced in all the discussed disorders, but specific EFs are affected in specific neurodevelopmental disorders and specific neurocognitive disorders, supporting the "unity and diversity" approach proposed by Miyake and colleagues some years ago [8]. Moreover, thisscenario could support the idea that EFs could represent a transdiagnostic construct across various mental and psychological disorders [37, 38], consistent with recent dimensional approaches to psychopathology, such as HITOP and RDoC, and with recent papers on these topics [39-43]. Furthermore, this scenario could also support the development of transdiagnostic interventions aimed at directly improving specific EFs and that cut across diagnostic categories, rather than being limited to specific diagnostic categories and boundaries [38]. However, more research is needed in these fields.

CONCLUSION

EFs represent a fundamental domain for understanding adaptive behaviour across the lifespan. Future research should further clarify the relationships among executive subcomponents, their neural mechanisms, and their role across psychological and neurological disorders, thereby contributing to more refined theoretical models and more targeted clinical assessment and rehabilitation strategies, as well as their role as a transdiagnostic construct [37, 38].

AUTHOR'S CONTRIBUTION

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

LIST OF ABBREVIATIONS

EF	=	Executive Function
SLD	=	Specific Learning Disorders
LBD	=	Lewy Body Disease
SAS	=	Supervisory Attentional System

CONFLICT OF INTEREST

Donatella Rita Petretto is on the Editorial Advisory Board of the Journal CPEMH.

ACKNOWLEDGEMENTS

Declared none.

REFERENCES

[1] M B, S S, R I, *et al*. Exploring the predictive role of early executive functions and self-regulation on functional outcome in neurodevelopmental disorders: A systematic review and meta-analysis. Neuropsychol Rev 2025; 2025(Nov): 17. http://dx.doi.org/10.1007/s11065-025-09683-5

[2] Cassiano RGM, Engeroff MA, Cidade BG, *et al*. Executive function intervention in the school context: A scoping review. Appl Neuropsychol Child 2025; 1-16. http://dx.doi.org/10.1080/21622965.2025.2579203 PMID: 41196758

[3] Hamady-Saad H, Engel-Yeger B. A systematic review on executive functions in female adolescents with eating disorders: Implications on daily life and relevance to rehabilitation. J Child Adolesc Ment Health 2025; 36(2): 237-69. http://dx.doi.org/10.2989/17280583.2024.2438367

[4] Stuss DT, Benson DF. Neuropsychological studies of the frontal lobes. Psychol Bull 1984; 95(1): 3-28. http://dx.doi.org/10.1037/0033-2909.95.1.3 PMID: 6544432

[5] Norman DA, Shallice T. Attention to action: Willed and automatic control of behavior. In: Davidson RJ, Schwartz GE, Shapiro D, Eds. Consciousness and Self-Regulation: Advances in Research and Theory. Plenum Press 1986; Vol. 4: pp. : 1-18. http://dx.doi.org/10.1007/978-1-4757-0629-1_1

[6] Damasio AR. Descartes' Error: Emotion, Reason, and the Human Brain. New York: Putnam 1994.

[7] Lezak MD. The problem of assessing executive functions. Int J Psychol 1982; 17(1-4): 281-97. http://dx.doi.org/10.1080/00207598208247445

[8] Miyake A, Friedman NP, Emerson MJ, Witzki AH, Howerter A, Wager TD. The unity and diversity of executive functions and their contributions to complex "Frontal Lobe" tasks: A latent variable analysis. Cognit Psychol 2000; 41(1): 49-100. http://dx.doi.org/10.1006/cogp.1999.0734 PMID: 10945922

[9] Diamond A. Activities and programs that improve children's

executive functions. Curr Dir Psychol Sci 2012; 21(5): 335-41. http://dx.doi.org/10.1177/0963721412453722 PMID: 25328287
[10] Diamond A. Executive functions. Annu Rev Psychol 2013; 64(1): 135-68. http://dx.doi.org/10.1146/annurev-psych-113011-143750 PMID: 23020641
[11] Zelazo PD. The development of conscious control in childhood. Trends Cogn Sci 2004; 8(1): 12-7. http://dx.doi.org/10.1016/j.tics.2003.11.001 PMID: 14697398
[12] Zelazo PD. Executive function and psychopathology: A neurodevelopmental perspective. Annu Rev Clin Psychol 2020; 16(1): 431-54. http://dx.doi.org/10.1146/annurev-clinpsy-072319-024242 PMID: 32075434
[13] Miyake A, Friedman NP. The nature and organization of individual differences in executive functions: Four general conclusions. Curr Dir Psychol Sci 2012; 21(1): 8-14. http://dx.doi.org/10.1177/0963721411429458 PMID: 22773897
[14] Friedman NP, Miyake A, Altamirano LJ, *et al*. Stability and change in executive function abilities from late adolescence to early adulthood: A longitudinal twin study. Dev Psychol 2016; 52(2): 326-40. http://dx.doi.org/10.1037/dev0000075 PMID: 26619323
[15] Friedman NP, Miyake A. Unity and diversity of executive functions: Individual differences as a window on cognitive structure. Cortex 2017; 86: 186-204. http://dx.doi.org/10.1016/j.cortex.2016.04.023 PMID: 27251123
[16] Duncan J, Friedman NP. How the brain creates unity and diversity of executive functions. The Frontal Cortex: Organization, Networks, and Function. Cambridge (MA): MIT Press 2024. http://dx.doi.org/10.7551/mitpress/15679.003.0012
[17] Zelazo PD. The Dimensional Change Card Sort (DCCS): A method of assessing executive function in children. Nat Protoc 2006; 1(1): 297-301. http://dx.doi.org/10.1038/nprot.2006.46 PMID: 17406248
[18] Zelazo PD. Executive function: Reflection, iterative reprocessing, complexity, and the developing brain. Dev Rev 2015; 38: 55-68. http://dx.doi.org/10.1016/j.dr.2015.07.001
[19] Moriguchi Y, Chevalier N, Zelazo PD. Editorial: Development of executive function during childhood. Front Psychol 2016; 7: 6. http://dx.doi.org/10.3389/fpsyg.2016.00006
[20] Diamond A. Executive functions. Handb Clin Neurol 2020; 173: 225-40. http://dx.doi.org/10.1016/B978-0-444-64150-2.00020-4 PMID: 32958176
[21] Ceruti C, Pecini C, Marzocchi GM. Executive function in children with signs of specific learning disorders. Res Dev Disabil 2025; 164: 105069. http://dx.doi.org/10.1016/j.ridd.2025.105069
[22] Farah R, Meri R, Horowitz-Kraus T. Enhanced functional connectivity of executive functions and attention networks during reading *versus* narrative comprehension in dyslexia. Brain Connect 2025; 15(6): 229-42. http://dx.doi.org/10.1177/21580014251358735
[23] Guerra A, Remaud J, Cadeau O, *et al*. Assessing executive functions in children with developmental dyslexia: A comprehensive approach. Dyslexia 2026; 32(1): e70016. http://dx.doi.org/10.1002/dys.70016 PMID: 41431932
[24] Smith-Spark JH, Henry LA, Messer DJ, Edvardsdottir E, Zięcik AP. Executive functions in adults with developmental dyslexia. Res Dev Disabil 2016; 53-54: 323-41. http://dx.doi.org/10.1016/j.ridd.2016.03.001
[25] Smith-Spark JH, Gordon R. Automaticity and executive abilities in developmental dyslexia: A theoretical review. Brain Sci 2022; 12(4): 446. http://dx.doi.org/10.3390/brainsci12040446
[26] Hessen E. Mild cognitive impairment and neuropsychological examination. Front Psychol 2025; 16: 1662151. http://dx.doi.org/10.3389/fpsyg.2025.1662151
[27] Julio-Ramos T, Mora-Castelleto V, Foncea-González C, *et al*. Neuropsychological differential diagnosis of Alzheimer's disease and Lewy body dementia: A systematic review. Neurologia 2025; (9)40: 884-914. http://dx.doi.org/10.1016/j.nrleng.2025.10.001
[28] Martyr A, Nelis SM, Clare L. Predictors of perceived functional ability in early-stage dementia: Self-ratings, informant ratings and discrepancy scores. Int J Geriatr Psychiatry 2014; 29(8): 852-62. http://dx.doi.org/10.1002/gps.4071 PMID: 24753076
[29] Marshall GA, Rentz DM, Frey MT, Locascio JJ, Johnson KA, Sperling RA. Executive function and instrumental activities of daily living in mild cognitive impairment and Alzheimer's disease. Alzheimers Dement 2011; 7(3): 300-8. http://dx.doi.org/10.1016/j.jalz.2010.04.005 PMID: 21575871
[30] Ikezaki H, Hashimoto M, Ishikawa T, *et al*. Relationship between executive dysfunction and neuropsychiatric symptoms and impaired instrumental activities of daily living among patients with very mild Alzheimer's disease. Int J Geriatr Psychiatry 2020; 35(8): 877-87. http://dx.doi.org/10.1002/gps.5308 PMID: 32281119
[31] Sui S, Wang M. Optimizing exercise dosage for executive function in Alzheimer's disease: A Bayesian dose-response meta-analysis of randomized trials. Arch Gerontol Geriatr 2025; 139: 106001. http://dx.doi.org/10.1016/j.archger.2025.106001
[32] Wells M, Alty J, Hinder MR, St George RJ. Falls in people with Alzheimer's disease: Exploring the role of inhibitory control. Neurosci Biobehav Rev 2025; 175: 106228. http://dx.doi.org/10.1016/j.neubiorev.2025.106228
[33] Johns EK, Phillips NA, Belleville S, *et al*. Executive functions in frontotemporal dementia and Lewy body dementia. Neuropsychology 2009; 23(6): 765-77. http://dx.doi.org/10.1037/a0016792 PMID: 19899835
[34] Gonzalez-Gomez R, Rodríguez-Villagra OA, Schulte M, *et al*. Neurocognitive factorial structure of executive functions: Evidence from neurotypicals and frontotemporal dementia. Cortex 2021; 145: 79-96. http://dx.doi.org/10.1016/j.cortex.2021.08.015
[35] Gasca-Salas C, Obika S, Rodríguez-Rojas R, *et al*. Cognitive fluctuation scale in non-demented patients with Parkinson's disease. Mov Disord Clin Pract 2025; 12(11): 1925-32. http://dx.doi.org/10.1002/mdc3.70295
[36] Firbank M, Kobeleva X, Cherry G, *et al*. Neural correlates of attention-executive dysfunction in Lewy body dementia and Alzheimer's disease. Hum Brain Mapp 2016; 37(3): 1254-70. http://dx.doi.org/10.1002/hbm.23100
[37] Ganai UJ, Bhushan B. Executive functions and psychopathology: A transdiagnostic network analysis. PLoS One 2025; 20(12): e0338435. http://dx.doi.org/10.1371/journal.pone.0338435
[38] Petrovic P, Skoglund CB, Sonuga-Barke E. Editorial: Executive functions in psychiatric science, clinical practice and beyond: A Transdiagnostic Window on Functional Heterogeneity. Front Psychiatry 2025; 16: 1743127. http://dx.doi.org/10.3389/fpsyt.2025.1743127
[39] Kotov R, Krueger RF, Watson D, *et al*. The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. J Abnorm Psychol 2017; 126(4): 454-77. http://dx.doi.org/10.1037/abn0000258 PMID: 28333488
[40] Kotov R, Cicero DC, Conway CC, *et al*. The Hierarchical Taxonomy of Psychopathology (HiTOP) in psychiatric practice and research. Psychol Med 2022; 52(9): 1666-78. http://dx.doi.org/10.1017/S0033291722001301 PMID: 35650658
[41] Cicero DC, Ruggero CJ, Balling CE, *et al*. State of the Science: The Hierarchical Taxonomy of Psychopathology (HiTOP). Behav Ther 2024; 55(6): 1114-29. http://dx.doi.org/10.1016/j.beth.2024.05.001 PMID: 39443056
[42] Insel TR. The NIMH Research Domain Criteria (RDoC) project: Precision medicine for psychiatry. Am J Psychiatry 2014; 171(4): 395-7. http://dx.doi.org/10.1176/appi.ajp.2014.14020138 PMID: 24687194

[43] Farías Venegas C, Varela Espinoza LF, Ramírez Matta C, Barra Cañas B, Araneda Maldonado M, Sánchez Oñate A. New developments in psychiatric classification: A transdiagnostic approach. Cureus 2025; 17(5): e84580. http://dx.doi.org/10.7759/cureus.84580 PMID: 40546608