



## Evidence-based Psychological Intervention in the Treatment of a Pre-adolescent with Attention Deficit/Hyperactivity Disorder: The Circumplex Approach

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### Abstract

**Introduction:** The manifestation of significant behavioral problems, inadequate social and adaptive abilities, and high levels of depressive symptomology have consistently been observed in children and adolescents with multiple disabilities including those with attention and hyperactivity disorder. Understanding, evaluating, and addressing this magnitude of emotional, behavioral, and cognitive problems requires a systematic, integrative approach to psychological intervention that functions as a cascade network.

**Purpose:** to present an evidence based psychological intervention in the treatment of a pre-adolescent with attention deficit/hyperactivity disorder following the circumplex approach beyond pharmacological therapy

**Methods:** A case study with ADHD diagnosis. A mixed method has been identified for more realistic use of psychological intervention in social settings and in addition to a single subject design (Part A), a qualitative approach (Part B) has been preferred. The study incorporated a multiple non-competitive design of behaviors using qualitative explanations in the mixed design.

**Results:** Based on the obtained data, the implementation of psychological intervention followed in the same line by the team has contributed to the mitigation of negative behaviors in the living and learning environments. Moreover, these changes achieved by intervention practices in combination with pharmacological therapy have resulted in short-term effects.

**Conclusion:** The approach demonstrated how a mental health professional-led approach can be applied in partnership with educators to assess and address the educational and behavioral needs of a pre-adolescent with multiple disabilities. It is a valuable practical procedure and complementary to pharmacological therapy for addressing concerns and alleviating the distracting conditions of a pre-adolescent with ADHD in social settings.

**Keywords:** Circumplex Approach; Evidence Based Psychological Intervention; Pharmacological Therapy; Case Study; ADHD

### Introduction

Children and adolescents with disabilities often exhibit a wide range of problems such as significant behavioral problems, inadequate social and adaptive abilities, and high levels of depressive symptomology [4,33].

In the case of children and adolescents with multiple disabilities, the researchers stated that the goals involved in educational interventions were significantly different from those of typical progressive children [5,6-14].

ADHD is also a predominant neuro-developmental disorder - affecting approximately 5% of children and adolescents worldwide, often associated with other psychiatric comorbidities [1], and functional impairment and long-term negative outcomes [29]. Given the heterogeneity in neuropsychological and symptom profiles, theoretical models of ADHD have suggested that multiple dysfunctions may be involved leading to specific impairments [24,36,42].

It also predicts a variety of adverse outcomes, such as future behavioral disorder, antisocial behavior, anxiety and mood disorders, substance abuse, as well as physical injuries, traffic accidents, and communicable sexually transmitted diseases, among others [3-19].

However, it has been reported nowadays that many children with multiple, despite the degree and complexity of their inadequacy, are taking advantage of the best training interventions possible [6,9,14]. There are also reports that refer to behavioral assessment and treatment efficacy for ADHD [15-37]. The report evidences show that by evaluating functional behavior helps researchers and mental health professionals contribute to elaborate the proper psychological interventions [25]. However, children with multiple disabilities demonstrate various problems in the emotional and cognitive domain as well. Therefore, understanding, evaluating and treating this magnitude of emotional, behavioral, and cognitive problems requires a systematic and integrative approach of intervention.

Recommendations for treating ADHD point out to multimodal approaches including pharmacotherapy and psychosocial interventions. However, since ADHD is a life-long condition, it is essential to determine the long-term outcomes of the different treatment modalities. The Multimodal Study of Children with ADHD [23-41] is a large trial comparing four treatment modalities (behavioral intervention, medication, combination treatment, or routine community) with some outcomes over 14 months (controlled phase) and 8 years (open phase). Results showed that, after 14 months of follow-up, single or combination medication with behavioral intervention had better outcomes in improving ADHD symptoms, compared to behavioral intervention and community care. Combined behavioral intervention and medication were no better than medication management but allowed the use of low doses. Secondary analysis examined the success rates determined by a cutoff in outcome at the end of treatment [38]. The results found an increase in the success rate for combined treatment and medication management and confirmed the initial results.

Psychosocial interventions do not appear to be effective as a single treatment, but evidence suggests that they may be effective as a complementary treatment to pharmacological therapy for individuals with residual symptoms [20]. The best evidence comes from a study conducted by Safren [32]. The study enrolled 86 young people with ADHD who were already prescribed medication and randomized them to cognitive-behavioral therapy or relaxation with support. In addition, the behavioral consultation model has provided positive effects in the treatment of behavioral problems and social maladaptation for children and adolescents with social problems and behavioral disorders [2,31,43].

Hence, based on the magnitude of the problems in overall functioning of children with ADHD, it is of major importance to elaborate the proper psychological intervention for their appropriate treatment. The given work is related to the need of presenting a feasible approach: an effective and efficient way of providing services to the children with ADHD through a shared model of service delivery; the circumplex approach [26,27].

## Methodology

### Case study

A male diagnosed with ADHD, a pre-adolescent who lived in home family for persons with disabilities.

### The circumplex approach as a psychological intervention (CAPI)

There is a need for an approach that would show unique relationships within the visual framework. Therefore, a circular pattern is designed that is divided into quadrants with continuous cross axes. This type of approach serves to three purposes: [26,27].

- It is a representation of a landscape with a set of data.
- Provides an area in which the relationship between different variables can be seen.
- Units may be evenly occupied to show uniformity and accuracy.

The advantages of this approach for psycho-clinical intervention include:

- Focus on mitigating adversarial/defensive behavior/resolving problems

- The indirect form of service delivery, which allows persons in the natural environment (i.e., careers, educators, and teachers) to be important agents of intervention; and
- The use of objective methods, data collection in the affective domain, interpersonal relationships, and the cognitive domain (communication and speech).

### Such an approach

- Enables the identification and analysis of situational conditions, event placement and response intervention that influence the intended change. The model is specifically designed for clinical evaluation, treatment planning and effectiveness in intervention outcomes [28].
- Emphasis is on the collection of data from a variety of sources and qualities, which allows for a functional assessment of target behaviors and leads to the development of an appropriate practice-based intervention strategy.
- It provides an “internal perspective” on the relationship of the person to others, and the evaluations of mental health professionals or observers, who provide an “external perspective” on the same system.
- It is also worth emphasizing the ongoing and systematic evaluation of the child/pre-adolescent response to treatment and programming for the maintenance and generalization of the effects of psycho-clinical intervention.

### A mixed method

For a more realistic use of practicing the circumplex approach of psycho-clinical intervention in social settings and in addition to single-subject design (Part A), a qualitative approach (Part B) has also been preferred.

In this theoretical-practical research, the variables are as follows:

- **Dependent variables:** Percentage of compliance behaviors, increase in social, academic, and communication skills
- **Independent variable:** CAPCI- the circumplex approach as a psychological intervention (Part A).

By focusing on a single subject, many of the problematic behaviors in a home family, day-care, and school system that affect daily functioning can be systematically studied with the help of multiple baseline designs.

The study intertwined a multiple baseline non-competitive behavioral design using qualitative explanations in the mixed design helping to assess behaviors across different situations both in different environments and with other persons. However, in a non-competitive multiple baseline design, the data is not aggregated at the same time, and multiple non-competitive baseline designs delayed throughout the pattern of behavior are particularly preferred in this study in order to show the relationship between dependent and independent variables due to real context.

In real context situations, problem behaviors can occur at any point during different environments.

During the academic year, caregivers and educators made their conclusions and priorities about problem behaviors so that the approach could be used to provide interventions to many problems.

The rest of the problematic behaviors were addressed in part B. Behaviors that were considered qualitatively in the study were: Inappropriate behavior with unusual demands to get out of school and home family independently - jumping through walls or climbing windows, refusing to sleep on his bed, mistaking inappropriate post-meal, using heavy vocabulary rejecting academic assignments, rejecting pharmacological therapy, etc.

This is because intrinsic validity and social acceptance procedures are of great importance to validate the quality of the study. Multidimensional studies of intrinsic validity have major implications because it is not possible for researchers to use the experimental design without further predefined internal validities studies to establish the functional relationship between the independent variables and the dependent variables (Dave and Schneider, 1998). Dane and Schneider determine potential dimensions when evaluating internal validity. These dimensions of the consultation processes are: (a) exercise, (b) exposure, (c) the quality of the intervention delivery, (d) participant response.

### Description of the design

The single-subject design, called “Non-Competitive Basic Design” by Watson and Workman [44], has been used with increasing flexibility to reduce the length of initial data or to add new behaviors, situations, or entities. The design includes an outline of the set AB, where the amount of time the variable has passed is conditional. The initial data in the first phase has no relation to the data

in the other stages level (i.e., baseline-for-intervention) of analysis [16].

During the initial period, repeated measures of the dependent variables occur to establish data trends prior to the intervention procedures. After the baseline, an interventional procedure is introduced at a level. Repeated multi- observations continue as at baseline to measure what changes, if any, occur at the levels of the dependent variables. If systematic changes are observed in the dependent variables each time the intervention procedure is introduced at a specific level, but not otherwise, then a functional link between the independent and dependent variables is established.

### Participant-case study

A 13-14 year-old pre-adolescent with a mild disability and ADHD diagnosis living in a home family has attended the public school. There are also physical health concerns such as asthma using Ventolin. During the 8 month period, the participant has demonstrated as following: not taking classes, threatening other people and physically attacking them, often screaming, often feeling ill, destroying/damaging other people's personal belongings or the home, family, showing an antisocial behavior with other children at school, disposing of their immediately changed feelings, talking like a motorcycle, being on the go, experiencing outbursts of anger, demonstrating a need for attention, his schooling was very weak, not obeying to the school rules, home family and daily center, not staying in his place, being stubborn, behaving impulsively, arguing and disagreeing with pharmacological therapy.

### Environment

Psychological interventions are performed at homefamily, at school, at the Day Care Center, the Psycho- Clinical Service Office, and the Psychiatric Service Office for Children and Adolescents at the Community Mental Health Center.

### Instruments for collecting participant data

- **Ecological Assessment Form:** The form has been developed using resources. It is planned that the form will be used to gather first preliminary case information in all sub-ecosystems (home-family, school and community) and identify areas of interest.
- **Behavioral Control Form:** It is planned that the form is used as the first preliminary information on the severity and diversity of subject inappropriate behaviors [30].

- **Communication Skills Information Form:** The purpose of the form is to determine the performance of communication skills; functional use, receptive, expressive language and social interaction. There are indicator units in the "Functional Use of Communication" section, in the "Receptive Languages" section, in the "Expressive Languages" section, and in the "Social Interaction" section.
- **Functional Analysis Forms:** For the forms of functional behavioral assessment, Hanley's "Functional Assessment" [15], was used. Implementation of the analysis forms was performed using Ford's work [13]. The relevant units are;
  - **Form of Functional Analysis:** Problem Determination and Prioritization.
  - **Functional analysis:** The history and quality of life of the subject
  - **Functional Analysis:** Event Logging, ABC Functional Analysis Form, - Functional Analysis Observation- "matching of behavior on demand". Observation was measured at different time intervals inspired by four standard parts of the Iwata Form [17]. These are; 1) Control 2) Concrete reinforcement, 3) Demand 4) Interest/attention.
  - **Functional Analysis:** Developing Hypotheses. There is a definite decision about the formal hypothesis.
  - **Functional analysis:** Systematic treatment planning. The form is to create a systematic intervention based on objective hypotheses.
  - **Functional Analysis:** Group Meeting/Order. The purpose of the form is to provide data that includes the implementation and results of the decisions made at the previous meeting, the new agenda items, the decisions made, the division of responsibilities, and the timing of the next meeting as a form of future consultation.
  - **Plan Evaluation:** It is the evaluation of the intervention plan applied after applying the planned guidelines. If the positive changes are observed in the form, if followed the plan developed if the hypothesis is still correct, the expression of the learning strategy that has been fully adopted or abandoned has occurred.

### Data collection tools for home - family, daily center and school

- Open discussion forms with caregivers and educators to evaluate what is useful and what needs to be improved

- Open forms of discussion with teachers - to provide valuable guidance for following appropriate interventions
- A rapid information procedure implemented before psychological intervention.

### Preparation, Development and Implementation of the Intervention

The purpose of this application is to have a common language for collaborative participation with caregivers/educators and teachers in intervention processes. The process is conducted through meetings providing the information needed for a collaborative approach to the case/subject and about behaviors. In addition, direct surveys were conducted at the home family, day care center, and at school and other social settings.

### Steps of implementing of CAPI-processes

- **Consultation negotiations:** Intervention processes began with consultation negotiations. Purpose of preliminary consultation talks; is the development of collaboration with home family caregivers, Day Care Center educators and teachers. Discussion of the guidelines for how to proceed, summarizing their roles, and trying to determine in this step the treatment of the child's behaviors, needs, and strengths [40].
- Identifying problematic behaviors/academic/educational and communicative concerns Includes the process of defining problems together.
- Analysis of the intervention in problems/disturbances. Baseline data were collected when defining the target behavior assigned to the subject or achieving the desired level of performance.
- Functional analysis used in the intervention process. In this study, it was decided to conduct direct observation of inappropriate/non-compliant behaviors, and the number of sessions needed to determine the function of inappropriate behavior. After obtaining the functional analysis data, the hypothesis was confirmed.
- The decision that the behavior problem and its function should be clearly defined after the functional analysis. First, operational intervention applications that include a positive behavior modification system safe for behavioral problems should be implemented.
  - Problematic behaviors and explanations: Cause

- Indicator of Incompatible Behaviors/Behaviors Involved in the study: intense screaming and constant screaming, physical abuse, biting, descriptive behaviors, refusal associated with more self-harmful actions, object destruction, insulting words, refusals of pharmacological therapy.
- Behavioral Consequences: The effects of the intervention were based on the observation of the subject's performance
- The expected behaviors of the child are described as follows: the child meets the directive/requirement by creating a zero level of the indicator of non-compliant/post-demand behavior. Five of these behavioral outcomes have been attempted to be expressed in a graph of the baseline.

### The decision that the behavioral problem and its function should be clearly defined after the functional analysis

#### Part A: Targeted behaviors represented by the non-competitive basic research method

The first target behavior was determined by a joint decision to be appropriate to the cultural structure of the home-family. At weekends, the home family comes together and social cohesion was ensured. The subject is liked to cook, in preparation of the lunch meal, was assigned to help prepare it for the home-family, and the intended behavior was set out in the consultation conversation conducted with the home-family residents.

#### Intervention process to achieve first behavioral outcome related to compliant behavior when asked

##### Behavioral outcome

When the subject is required to perform social skills that contain certain steps that can be considered as a lunch routine in a social activity-taking place in the home environment, the child meets the requirement without indicating any/non-appropriate behavioral indicators.

#### Decision on intervention and application

*Reasoning for intervention decision:* The ability of social behavior to assist in meal preparation is not only an opportunity to develop home-family communication, but also requires the subject to intervene in relation to tangible system malfunction. Thus, by adjusting the level of social stimulus, responses that produce appropriate behavior can be obtained [12-21]. The tactile approach gives the impression that it resembles similar applications to form

processes. The closest behavior to the desired behavior in the formation process has been reinforced to support the desired new behavior. The training process is used to teach a new skill that the subject has never done before [7]. At the same time, the training process can be used together with the control stimulus in providing the subject with academic and social behavior [7]. Therefore, the subject looked at a pattern of preparing some food ingredient while learning it from the caregivers until an 80-90% was reached, then it was interrupted in order to stimulate that to ask for it himself. Intervention was initiated again when all baseline data were related to "percentage of compliant behavior" when "required request" was sustained.

### **The process of intervention is performed to achieve the second behavioral outcome related to singing a song/holding a chord/musical rhythm when required**

In discussions/meeting with caregivers/educators in the home family it was determined that the subject had a strong sense of singing and musical rhythm.

#### **Behavioral outcome**

When the subject is required to perform social skills that contain certain steps that may be considered as singing a song/using an instrument during the week/during birthdays/during various social activities, the child meets the requirement without indicating any indication of/non-compliant behavior or problems in communicating and interacting with others. However, as the subject tended to use the musical instrument improperly in the home family environment, it was decided that there should be a goal of keeping pace, as other young people with disabilities were bored of noise and time use in any time. Subsequently, the musical instrument along with the singing of a song was considered as leisure activities and thus the subject had the opportunity to enhance the quality of life and to have a chance of using proper communication. When the subject was asked to sing or play the musical instrument (in monthly activities), he increased his participation in the process without indication of inappropriate behaviors/behavior and at the same time improved his interaction with caregivers/educators and residents home-family and would occasionally talk to his mother on the phone.

#### **Decision on intervention and application**

Reasoning for intervention decision: It was started to intervene after determining the cause of inappropriate behavior according to

ABC functional analysis. The functions of behavioral change processes are again supported using the literature on the behavioral change method. Motivational studies are included at various intervals along with reinforcements e.g., "We are very happy when you sing songs". Generalization is planned to be at home - family, day care center and school (rarely).

### **The third problem related to emergency intervention when asked to improve communication and social interaction with others**

A repetition of destructive behavior that had been exposed weeks/months ago has appeared in the classroom, at rest, and in the home-family. The reason for creating an intervention plan is that the subject begins to exhibit destructive behaviors such as screaming, biting, physically assaulting others, using heavy vocabulary, and so on. For this reason, it has been stipulated that the entity should develop its own compliant behaviors related to communication and social interaction.

#### **Behavioral outcome**

When the subject is required to perform communication and social skills that contain certain steps that may be considered as seeking permission, expressing thanks, apologizing, when promised to attend extracurricular courses of drawing in the afternoon, the child meets the requirement without showing any signs of/non-compliant behavior or problems in communication and interaction with others.

#### **Decision on intervention and application**

Intervention decision reasoning: According to functional behavioral analysis, behavior is related to teaching "because" where cause-effect relationships have been tried. "Because" is a concept as well as a feature of being a union [7]. According to the same authors, it is not possible to learn some concepts by describing them; like the concept of green. In this case, learning of compliant behavior is performed by giving many examples. Thus, it is planned to use the conclusions "cause", "because" to explain that there are no "outsiders" and in accordingly cannot and should not hurt other people nor offend them. The need for "additional learning" arose after the fact that the subject did not show to clearly perceive the concept of "because" [40] for immediately bursting into crying and opposing/defensive behavior.

### The fourth problem related to the intervention when required to comply with the curriculum and improve school performance

One of the major problems that the subject has often been exposed to in committing a harmful act, it has been the tendency to appear to play in the neighborhood and instead to beg and disrespect the learning schedule. To trigger a neural shift, it is possible to give a stimulus to going out after completing certain tasks at school.

#### Behavioral outcome

During the implementation of this method, it has resulted that the subject has shown early interest in performing tasks very quickly and often has been identified activation of a defense mechanism of “not having any learning task” or a hyperactive state associated with a loss of concentration. However, at least, he has become aware that there must be a set schedule for doing the tasks and producing good results in school. This approach was performed in collaboration with the assistant teacher who always wrote a notebook on which tasks to focus on.

#### Decision on intervention and application

Reasoning for intervention decision: Based on functional behavioral assessments, it is justified to follow a collaborative school-family approach. Sheridan and other scholars have noted that Joint Behavioral Consultation has provided good support for correcting challenging behaviors by implementing comprehensive treatment processes [39]. The approach was based on the assumption that student behavioral regulation and academic performance will positively affect when home and school systems are in coordination with one another. According to [8], complex learning-related situations may require work in-group in more than one area of specialization, as children with disabilities (multiple disabilities) can learn differently from their peers. Procedural steps of joint consultation include (a) identifying common problems, (b) analysis of common problems, (c) treatment, and (d) mutual treatment measures.

### The fifth problem relates to when multi-clinical intervention was required as a process of compliance with joint consultations with pharmacological therapy to achieve the outcome of positive change

During the stages of demonstrating negative symptoms and relapse, one-dimensional multi-clinical intervention was evaluated in

order for the subject to receive the message uniformly/to improve one’s mental health.

#### Behavioral outcome

Behaviors such as physical anger, harmful attacks, repetitive behaviors, and anger attacks that were most prevalent determinants of inappropriate behavior in children in particular, anger outbreaks have been reported to occur frequently when the child is treated as a common behavior indicating violence to oneself or the individual oppositional attitude. When these behaviors are repeated frequently within a 6-week period, the subject is psychologically prepared to participate in psychiatric consultations. It is important here to emphasize the child-counseling approach. The consultative approach to the subject had to be adapted during the process of psycho-clinical intervention. Interaction was realized through eight categories of behavior including the initiative, confirmation, response, turn, attention, intensity regulation, affective involvement, and independent action [18].

#### Decision on intervention and application

*Reasoning for the intervention decision:* Based on functional behavioral assessments in order to reduce risky behavior and enhance appropriate behavior; thus, joint consultations are planned and implemented, in addition to behavioral and educational consultations; were also conducted with the subject the psychiatric consultations with the scope to uniformly achieving a sustained state of his mental health by agreeing to pharmacological therapy of taking Methylphenidate 1/4 in the morning and 1/4 in the afternoon associated with Diazepam in cases of agitated states [34].

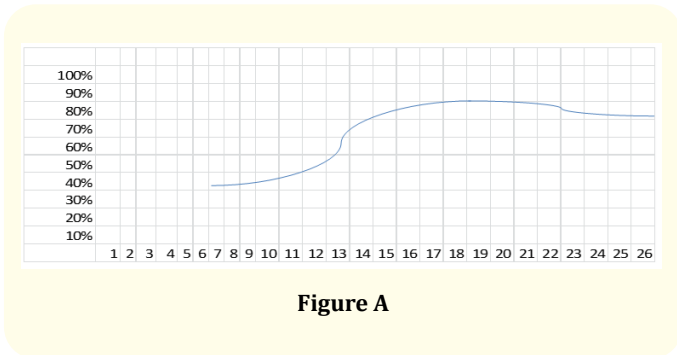
#### Part B: Inter-observation and procedural reliability

In the multidimensional study of intrinsic validity, (a) adherence (b) exposure, (c) nature of the intervention (d) differentiation of the intervention program, and (e) participants’ response dimensions. In this study, interobserver reliability was calculated by choosing from different interventions and initiation levels. Efforts have been made to determine inappropriate and appropriate behavior on demand.

#### Data analysis

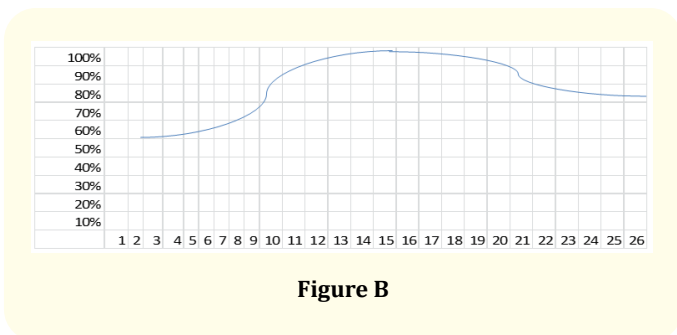
When applying the circumplex approach to psychological intervention.

Part A



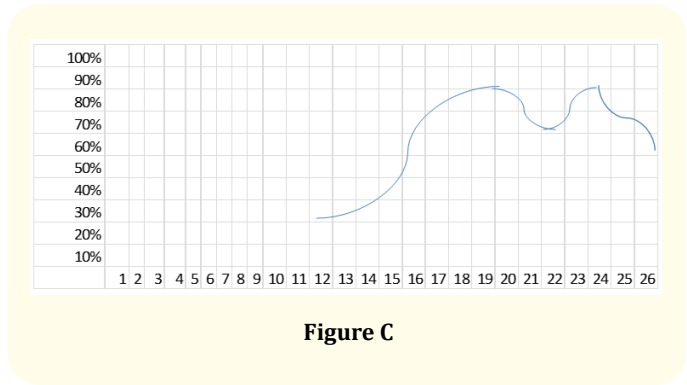
**Compatible behaviors at first behavioral outcome related to behavior when asked to help prepare meals for the family home ( Figure A)**

The subject began during the seventh month to engage in preparing meals for the family home while being in the presence of the caregivers. Changes ranged from 40% - 60% until the eleventh month. In the following, his commitment has been higher to 70%.



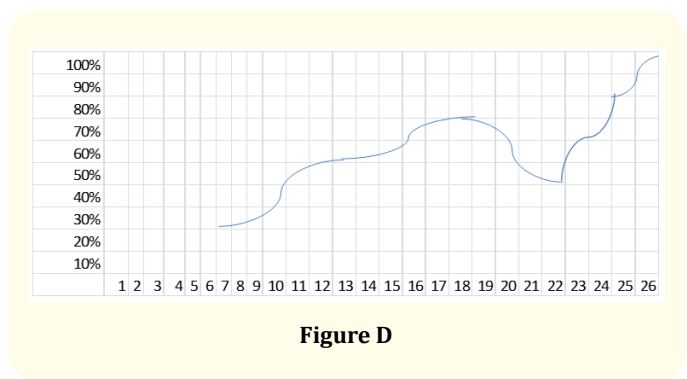
**Compatible behaviors to achieve the second intervention outcome when asked to sing a song/hold a chord/musical instrument ( Figure B)**

The subject began during the third month to engage in afternoon social activities in home family while being in the presence of the caregivers. Changes ranged from 60% until the eighth month. In the following, his commitment has been higher to 80%- 100% but associated with self fulfilled moments without a limit by creating noisy moments in other residents. After these states, there have been noted some exceptions to use the musical instrument only in Day Care Center for social activities.



**Compatible behaviors related to emergency intervention when required to improve communication and social interaction ( Figure C)**

The subject began during the third month to engage in afternoon social activities in home family while being in the presence of the caregivers. Changes ranged from 60% until the eighth month. In the following, his commitment has been higher to 80%- 100% but associated with self fulfilled moments without a limit by creating noisy moments in other residents. After these states, there have been noted some exceptions to use the musical instrument only in Day Care Center for social activities.



**The fourth problem related to the intervention when asked to respect the learning preparation schedule and improve school performance ( Figure D)**

The subject began during the seventh month to engage more seriously in the learning preparation schedule in home family while being in the presence of the caregiver or not. This task was not consistent due to his instability in demands to go out the most



considerable of the time. Another factor that has given the style of home family: other residents were all adults and had their free time to go out.

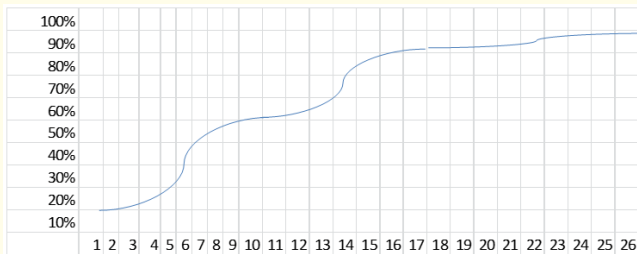


Figure E

**Compatible behaviors related to multi-clinical intervention when required to comply with joint consultations with pharmacological therapy to achieve positive change outcome ( Figure E)**

The subject began during the second month to participate in consultations. It varied due to his emotional lability and his ability to concentrate but never missed any of them. It was associated by refusal attitudes but despite the severity of symptoms, he tried to listen to the advices. The real reason that the subject was having this kind of pattern of lack of concentration and irritability and other forms of reactions are due to energy deficiencies nowadays, due to the influences of the electromagnetic waves in his life.

**Part B**

External validity in the study has attempted to reveal from the data held. Multidimensional internal validity studies, social validity conducted by home-family social caregivers, teacher, and others in the classroom proved positive at significant levels compared with the beginning despite having fluctuations.

**Findings and Discussions**

**When applying the circumplex approach to psycho-clinical intervention, the study noted**

**Mitigation of oppositional/ defensive behavior, mitigation of problems and concerns**

The subject’s behaviors have turned out to be mitigated when offered a social stimulus for which he was interested in. Here, a fac-

tor on the subject side is his attitude response to his “problematic” situation, and this reaction takes the form of an adaptation strategy. The aspect and reaction of the subject is represented by a reaction of attitude (cognitive, emotional, action) to the situation of his “problem”. This response to attitude then influences the subject’s behavior, which is accessible to his environment in the manifestations of his behavior.

The indirect form of service provision, which allows persons in the natural environment (i.e., caregivers and teachers) to be important treatment agents; and following group instructions facilitated the intervention of the subject but at the same time it was evident that the subject was conditioned to react to the same reaction of the surrounding environment. Here, a factor on the side of caregivers/educators and teachers is an intervention response that takes the form of steps that lead to setting boundaries and opening the subject’s perspectives. This is followed by the environmental response, namely the caregivers/educators, which the three steps of informed intervention (1) identifying the subject’s relevant characteristics and differences with ADHD and its condition, 2) formulating the subject’s individual educational needs, and 3) planning and implementing intervention steps focused on setting boundaries and the opening up of subject identities and perspectives. Defining boundaries is more about forming the subject’s identity; opening up perspectives shows his attitude towards the future

Enabling the use of objective multimodal methods, data collection in the affective field, interpersonal relationships and the cognitive field (communication and speech) and relevant intervention by field: The use of multimodal methods to obtain information about the subject’s constant change or state in the affective, social, and academic domain has been the key source of the functioning of the circumplex approach of psycho-clinical intervention. From the perspective of different types of adaptation strategies, is found, for the intervention, also the demonstration of “Open Repentant” by the subject and thus the intervention should provide support to continue to change his problematic situation. Regarding other types of adaptation strategies [37] but especially for closed attacks, the intervention primarily aimed at creating conditions for change in the willingness to change. More specifically, e.g. the child’s identity (towards conforming identity) and the level of belief in change, that is, perspective (towards an open future) but also reconciling with medical assistance as an angle that can be relied upon because of the neurobiology of his ADHD.

## Results and Discussion

The purpose of this paper was to present an evidence based psychological intervention in the treatment of a pre-adolescent with attention deficit/hyperactivity disorder following the circumplex approach beyond pharmacological therapy.

Based on the findings of this paper, provides evidence that the implementation of a circumplex approach of psychological interventions by the same line by the multi-disciplinary team:

- Has influenced the mitigation of negative behaviors mainly in the living environment rather than the learning environment
- The alleviation of anger outbreaks and the emergence of any positive changes in interpersonal relationships and mode of communication were evident.
- Despite the interventions, the educational concerns were present most of the time demonstrating symptoms of hyper-focusing with the inability to break focus, difficulty with prioritizing focus, being incapable to focus on a task for any length of time, impulsiveness, mood swings and restlessness.

Moreover, however, these changes achieved by intervention practices relying also on medical assistance (pharmacological therapy) have resulted in short-term effects, which is an indicator of the necessity for continued intervention.

The combination of pharmacological and psychosocial treatments is supported by both evidence of the effects of each of the treatments used in isolation, as well as the clinical reality that the use of single treatments is rarely sufficient to manage the total impairment experienced by children with ADHD [10,11,22,35].

They all provide evidence that treatments combining medications with behavioral treatments, both in the context of family and school, are more useful for managing social problems and behaviors as well as for preventing long-term difficulties such as antisocial behavior in children with ADHD.

## Conclusion

The circumplex approach is a valuable practical intervention

and is complementary to pharmacological therapy for addressing concerns and alleviating the distracting condition of the child with multiple disabilities in social settings. Furthermore, the changes of some compliant behaviors achieved in practices of the approach are of transient effects and do not remain stable over time due to the very nature and etiology of ADHD.

The implementation of the circumplex approach is acceptable despite the limitations with the single-subject design methodology. Thus, it can be believed that combined pharmacological and psychological interventions remain the best treatment options for most children and pre-adolescents with ADHD and efforts are needed to refine methods for individualizing the best possible combination of these interventions in order to maximize their social and clinical use in daily practice.

## Recommendations and Further Research

The study is of importance to determine the contexts and conditions in which access is more or less effective using other cases as participants with ADHD. In closing, will be given three issues related to delivering and receiving interventions that may be important, as similar research requires methods to enhance and extend effective treatments for ADHD.

- The first issue is the need to pay more attention to the appropriateness of treatment to be pursued by caregivers/educators in interaction with children/adolescents in the home care/Institution, given the critical role these attitudes play in engaging children. The approach to ADHD treatment in a way that respects and addresses these attitudes and seeks to collaborate.
- The second issue is that unfortunately, combined treatments are often costly and time consuming, and can be perceived as limited. This implies leading to less medication and more intensive/extensive treatment of behavior. The treatment of using medications in high concentrations will worsen even more the energy deficiencies in all these children/adolescents. This is a factor that is occurring frequently in children's and adolescents and there is the necessity of treating the energy deficiencies and not just the symptoms.
- The last issue is the work needed to improve the ongoing implementation and monitoring of evidence-based psychological interventions in order to maximize results in treatment of ADHD. We can believe that efforts like these will drive

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