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Cognitive Remediation Therapy: a general overview

التأهيل المعرفي: نظرة عامة

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Abstract

The development of neuropsychology and the experimental results and evidence from brain and neurological injuries have contributed significantly to the emergence of neuropsychological and cognitive interventions. The concept of Cognitive Remediation (CR) was established in response to the cognitive deficiency that was seen in patients and to improve cognitive abilities. In this study, we will discuss CR by introducing the concept and determining an overview of CR, providing the most important approaches and programs used in CR, and review some of the results of the literature related to it.

Introduction

The late nineteenth century saw the beginning of the scientific understanding of how the brain functions, with the work of Broca (1865) and Wernicke (1874) and their findings on brain injury cases. This is referred to as a localizationist or pluripotentialist perspective of the brain. Each behavioral function was believed to be assigned to a certain area of the brain. The proof that sensory and motor strips had distinct regions that corresponded to feeling and movement in certain body parts provided more evidence for this claim. With the emergence of another viewpoint that challenges the localizationist view, Lashley et al. (1938) believed that the brain's mass action and that it functions as an equipotentiality, that is, all brain regions perform the same functions and that the degree of deficit was related to the amount of tissue lost rather than the location of the damaged tissue. (Podd, 2012). Other evidence emerged, such as Goldstein (1939) and Alexander Luria (1948, 1966, 1973), which acknowledged the brain's ability to automatically reorganize so that a different region could take over the function of the damaged region and that the patient could be taught to use strategies instead of the strategies he was learning with, and a treatment plan could be devised to develop and teach alternate functional systems. In their book on neurotraining, released in 1981, Craine and Gudeman outline their strategy for cognitive remediation (CR) and suggest "off-the-shelf" games that may be customized to help individuals with brain injury restore their cognitive performance. The introduction of personal computers, Lynch (1979) suggested Atari games and, subsequently, Apple II games that would be beneficial for people with cognitive impairment. Neuropsychologists started creating their own computer-assisted cognitive rehabilitation systems (e.g., Ben-Yishay et al. 1987; Bracy 1985; Gianutsos and Klitzner 1981). Although there was a lot of interest at the time, research was not done to a great amount, and neuropsychologists began to doubt the effectiveness of cognitive rehabilitation. With the accumulation of research on CR and its effectiveness, (Ponsford and Kinsella, 1988; Cicerone et al. 2000, 2005; Podd and Krehbiel, 2006) proved the effectiveness of CR on several aspects, such as cognitive, psychological, and social. (Podd, 2012). This study aimed to highlight the concept of through a conceptual background through a description and review approach. We will introduce CR as a new therapeutic approach in neuropsychological interventions designed to improve cognition. We will provide a general overview of CR; determine the target aspects for improvement in CR, as well as the most important models and approaches used in CR and its interventions, and exploring the effectiveness of CRT

on neuropsychiatric diseases by providing a summary of some of the literature.

1–Definition of CR

CR first began in World Wars I and II. Techniques have been developed to improve the attention and memory problems seen in military veterans after brain damage. (Boake, 1991). We will try to present and discuss various definitions of CR by presenting different definitions. The goal of CR is to enhance cognitive functioning and rehabilitate cognitively compromised individuals. By enhancing deficiency functions or creating new cognitive strategies, CR enables the therapy of cognitive deficits. Remediation might mean that a cognitive skill does not improve enough; it may have been better before and deteriorated. (Medalia, Revheim, & Herlands, 2009). All of these definitions emphasize improving cognitive processes through techniques to enhance them while also concentrating on restoring damaged Cognitive Functions (**CFs**). According to Medalia, Revheim, & Herlands (2009), CR is a behavioral therapy for people whose cognitive impairment interferes with daily functioning. Dandil, Smith, Kinnaird, Toloza, & Tchanturia (2020) suggest that CR interventions are a general term for psychological interventions that employ cognitive training exercises to address issues with Social Cognition (**SC**) and neuropsychological functioning.

2–CFs, Metacognitive, and SC as goals for improvement of CR

2–1–CFs

Cognition is a set of diverse abilities that allow an individual to recognize process and respond to the information provided. CFs are involved in daily activities, and CFs is an important factor for individuals (Kim et al., 2018). The focus is on the area of EFs (also called executive control) and refers to the set of higher mental processes necessary to focus and process information to automatically continue any activity, and to select and control behaviors that facilitate the achievement of goals, there is general agreement that there are three basic EFs according to (Lehto et al., 2003, Miyake et al., 2000); which are: **1)** Inhibition or attentional control, **2)** Working Memory (WM), **3)** cognitive flexibility. Through these high-level jobs, higher skills are built, such as thinking, problem solving and planning, which are generally considered essential skills for mental health and cognitive, social and psychological development (Diamond, 2012); As such, CFs are crucial to daily life. Thus, cognitive deficiencies affect a wide range of domains such as daily life, academic, professional and personal domains; Cognitive impairment is a common feature of various mental disorders; Cognitive deficits can be one of many symptoms of these disorders, or they can involve the ongoing change caused by the disorder (Kim, et al., 2018)

2–2–Metacognitive skills

Metacognition refers to a higher level of thinking that includes active control of cognitive processes. Activities such as planning how to approach a particular learning task, monitoring comprehension, and evaluating progress toward completing the task are metacognitive skills. Since metacognitive plays an important role in successful learning, it is It is important to study metacognitive activity to determine how to teach people to use their cognitive resources better through metacognitive control (Livingston, 2003), unconsciousness of wrong decisions (possibly as a result of neurocognitive impairment) may lead to inaccurate social interpretations and poor behavioral response choices that reinforce functional impairment (Davies, Fowler, & Greenwood, 2017).

2–3–SC

SC includes emotion recognition, theory of mind, empathy, explanatory style and insight. The SC function allows individuals to act in accordance with social norms and participate in determining other people's attitudes or intentions, and is also linked to professional and social functioning and a person's relationships (Pinkham & Penn, 2006), "The goal of social cognition is to provide a mechanism for action-oriented explanations of complex social phenomena"; When we interact with the environment we start from the input where we sense signals originating from the environment, and the sensations are detected by our sense organs such as the eyes, the sensations (such as light of a certain wavelength) are converted into perceptions (such as the color of fruit) based on prior knowledge and current context, after so decisions are made about what to do best; In response to these perceptions (e.g. is the fruit ripe? Should I eat it?), actions are planned and production begins in the form of bodily movements (e.g. catching the fruit), within this general framework of stimulus and response, we can have a subset of the processes involved with social stimuli (such

as reading facial expressions), social decisions (such as: Should I trust this person?), and social responses (making facial expressions) (Harvey & Bowie, 2012)

3–CR Approaches

Schwalbe & Medalia (2007) argue that CR techniques were initially designed to help improve cognitive performance in people who have had neurological injuries, when research showed that impairment at the neuropsychological level is also present in mental illnesses such as schizophrenia, researchers and clinicians began to investigate and apply Different types of CR approaches on samples of people with mental and psychological disorders, many models of CR used with mental and psychiatric disorders are based on the initial approaches developed for brain injury patients.

3–1–The Neuropsychological Educational Approach to CR (NEAR) Model

This approach, developed by Medalia, Revheim, & Herlands (2002), is a CR therapy technique specifically designed for cognitive dysfunction, and repairing, renewing and restoring abilities for use in cases of mental and psychological disorders who suffer from cognitive deficits. In contrast to cases of brain and neurological injuries, who usually have motivation to recover, cases of mental and psychological disorders, who are usually unmotivated and the source of their motivational difficulties from the disease itself or from possible repeated failures in learning situations. They are usually not motivated to participate in cognitive activities that includes repetitive exercises; to make such cognitive tasks intrinsically engaging for mental and psychiatric cases, the NEAR is designed to be more stimulating, dynamic, and enjoyable. (Schwalbe & Medalia, 2007). The NEAR, as stated by (Medalia, Revheim, & Herlands 2009; Medalia, & Freilich, 2008; Schwalbe & Medalia, 2007), focuses on individual training conducted in groups, combining techniques developed in both neuropsychological and Educational models to target neuropsychological deficiencies as they affect information processing and cognitive functioning. The NEAR it is group therapy that provides a high-level individual education, by allowing everyone in the group to work at their own pace in carefully selected tasks to participate and support his cognitive needs (Medalia, Revheim, & Herlands, 2009). In addition, CR is an educational activity using educational techniques developed in the field of education known to enhance learning; for example, training tasks involve many skills simultaneously, and presented in a real-life context. When information is learned in a context (e.g.: attention skills are activated in the context of a driving simulation experience as opposed to a set of flashing colored circles) it has been shown that learning is bigger and more sustainable (Schwalbe & Medalia, 2007)

3–2–Compensatory and Restorative Approaches

According to Kim et al. (2018), many therapeutic approaches have been developed for CR; because of the interest in its effectiveness first with cases of brain and neurological injuries to improve cognitive impairment resulting from brain injuries. The interest increased when the same cognitive impairment was discovered in mental and psychiatric disorders; As a result, different types of therapy have been developed in CR. It can be divided into compensatory approaches and restorative approaches, depending on the intervention. The compensatory approach is designed to help treat cognitive impairment by acquiring new skills or changing the environment, with the aim of improving behavioral adaptation. On the other hand, the restorative approach aims to restore and renovate CFs through repetitive practice based on brain flexibility. In addition, CR uses a variety of learning strategies such as: error-free learning, behavioral reinforcement, and group learning. These strategies are applied differently depending on the type of intervention.

3–3–CR approach based on neuropsychology/ neuroplasticity-based cognitive training

According to Biagianti, Castellaro & Brambilla (2021), most research on CR in neuropsychiatric diseases has been on schizophrenia. It examined a variety of rehabilitation approaches including computer-based training, educational programs softwares and therapist-guided strategy coaching in problem-solving tasks. Biagianti, Castellaro & Brambilla (2021) assume that CR methods are based on two foundations, the first is a CR based on a neuropsychological model of brain function; all CFs are considered separate in the brain and can therefore be evaluated independently of each other through a training approach, there are many programs that represent this model, including COGPACK, COGREHAB, Computer Assisted Cognitive Rehabilitation (CACR). These programs are based on the principle of focus on

tasks, gradation in the level of difficulty of exercises, and intensive and regular practice on tasks. Subjects undergoing these programs show improvements in verbal learning, WM, processing speed, executive functioning, attentional abilities, and work outcomes, the second is a neuroplasticity-based cognitive training (NBCT) is a form of CR that bases its theoretical principles on the concept of cerebral plasticity and neurogenesis. In NBCT, intact brain plasticity mechanisms are harnessed via computerized exercises to promote healthier neural system functioning (both in terms of increases in gray matter volume and plastic changes in cortical activation patterns). These neuroplastic changes lead to better cognition, increased resiliency to stressors, and overall improved functioning (Biagianti, Castellaro & Brambilla, 2021)

4–CR goals

CR aims to:

Improving, restoring, retrieving, and developing cognitive skills and increasing cognitive efficiency to improve independence, adaptation, and quality of life (Demily et al., 2016). Individuals adapt to the difficulties faced by individuals in daily life by enhancing abilities and skills by focusing on the strengths of each individual (Demily et al., 2016); either by training cognitive deficit functions or by allowing patients to learn strategies for making the best use of their residual functions, with the goal of improving how patients face their daily lives. (Frank, 2012), and these skills can be transferred to improve daily functioning (Emily, 2016).

To encourage patients to reflect on their thinking patterns and to plan and develop strategies to enable them to make behavioral changes (Dandil, Smith, Kinnaird, Toloza, & Tchanturia, 2020).

Bolger (1981) argued that the goal of CR "is to increase the mental capacity of the individual to process larger amounts of stimuli with greater accuracy and with greater attention to subtleties." Such an increase in the patient's ability to process information is viewed as a necessary component in the performance of complex cognitive tasks. (Kenneth, Barbara, Renee, & Raymond, 1997). For Bolger (1981), remedial tasks that focus on rudimentary (e.g., perceptual and attentional) processes as well as higher cortical functions are presented to the patient continuously throughout the rehabilitation program. The essential feature of the program is the emphasis on the patient's ability to integrate this higher-level CFs (Lawrence, 1997). The purpose of CR, which is a new psychological treatment, is to improve coping and compensation abilities and, as a matter of fact, psychosocial function (Hajri et al., 2016).

5–Principles of CR Practice

Shaun(2012)observesthatthegroupoftreatmentapproaches collectively referred to as CR can vary substantially and ranges from completing Sudoku exercises to using highly sophisticated computerized programs designed to enhance specific domains of CFs. Some approaches are completed individually, some with a therapist or coach, and some in groups. Some CR programs focus only on neurocognition (Fisher, Holland, Merzenich, & Vinogradov, 2009; Wykes et al., 2007), while others focus on social cognition (Horan et al., 2009), and still others focus on an integration of the two during treatment (Hogarty et al., 2004). Although not all CR programs focus on multiple cognitive abilities, the most effective programs target broad cognitive domains (McGurk, Twamley, Sitzer, McHugo, & Mueser, 2007). Eack (2012) adds that cognitive abilities are not targeted at random but in a hierarchical fashion from lower-order to higher-order CFs. This is based upon information processing models that indicate the need for simple cognitive abilities (e.g., attention) to support more complex information processing, such as reasoning, problem-solving, and other EFs. The belief is that higher-order cognitive abilities cannot be fully remediated unless the basic building blocks of cognition are also improved. Some CR programs also use cueing and fading from learning theory to help shape cognitive performance and progressively increase the difficulty of cognitive exercises. Cueing refers to the use of visual or auditory stimuli or external aids to help increase individuals' performance on a particular exercise; the techniques used in CR are designed to adapt to the difficulty of the exercises from the initial level until the development of each person's ability. In this way, CR is usually adaptive and focuses on providing enough challenge for people to participate and exercise their cognitive abilities. Eack (2012) summarizes some of the principles of CR through the principles of practice with individuals with schizophrenia, including:

Developmental strategies to improve cognitive performance and task completion.

Repeat cognitive exercises for several sessions until

performance improves.

Targets the development of basic cognitive abilities into more complex ones.

The application of external supports (usually auditory or visual) to improve cognitive performance.

The gradual removal of cues and external aids in cognitive exercises increases the difficulty.

Adjust the difficulty of cognitive exercises to remain challenging and engaging.

Connecting cognitive exercises to "real-world" behaviors and domains that work in the domains they support.

Use additional treatments and support to maximize the benefits of CR.

6–Methods of CR

The scientific literature has detailed a wide range of distinct cognitive rehabilitation techniques. The Wisconsin Card Sorting Test can be taught to help persons with schizophrenia perform better, according to some of the earlier research. Programs were then created to address the cognitive deficiencies linked to schizophrenia. The two main methodologies used by CRT programs are rehearsal learning and strategy coaching. Both of these strategies can be used in combination. The advantage of using computerized procedures is that they are more effective and standardized. Computer-based applications called Cogpack and Cogrehab target a variety of cognitive processes. Interactive training programs are used to target cognitive areas such as memory, attention, visual information processing, language, and motor performance. With the use of these tools, rehabilitation may be prolonged through personal computer-based exercise. With the use of these tools, rehabilitation may be prolonged through personal computer-based exercise. (Galletly & Rigby, 2013). According to Harvey and Bowie (2012), bottom-up training aims to improve basic sensory processes while top-down training focuses on higher-level cognitive skills. All of the effective strategies share several features that are important. Some studies have used mixed approaches, and others have used different approaches. Other attempts to improve functioning take compensatory approaches to adapt the environment to the individual's cognitive limitations. Harvey and Bowie (2012) believe that there is a set of intervention strategies, including:

6–1–Dynamic titration of difficulty

Task demands and requirements adapt based on patients' performance levels. There are optimum degrees of task complexity that result in the highest amounts of brain activity. With or without distracting stimuli, stimuli can be provided at different rates. Multiple settings in computer-based drill and practice activities can frequently be changed to get the best level.

6–2–Dosing considerations

Many interventions offer two 30-to-60-minute training sessions each week. Better improvements result from intervention sessions that are completed more successfully. Since the 1950s, it has been shown that spaced practice results in superior learning outcomes. Although the dose might be fairly low in some circumstances, there is a distinct dose response.

6–3–Strategic monitoring

Patients are encouraged to explain their thought processes and try other tactics, such as making verbal associations with the use of strategic monitoring. Contrary to the rote computerized drill and practice procedures, this part of cognitive rehabilitation is significantly more therapist-dependent. If people learn flexible problem-solving techniques, improvements in a wider variety of cognitive skills and the daily behaviors associated with those abilities may be more possible.

6–4–Between-session application

Some interventions have a defined curriculum focused on the application of the gained abilities in regular functional situations because it is believed that training a skill does little good without knowledge about its applicability. Some therapies have a structured curriculum intended to apply the gained skills in real-world situations. These "bridging groups" are a regular component of these interventions; however, it is not quite apparent what kind of bridging is necessary.

7–CR interventions: The Different Programs

Based on what Demily et al. (2016) mentioned there are many programs and interventions within the scope of CR in several cognitive domains such as memory, attention, and metacognition; they listed a set of programs with evidence and experimental findings. In memory programs, Hulme and Mackenzie used a cumulative repetition technique to focus on an articulatory recapitulation approach. Teenagers with intellectual impairments (aged 13 to 18) participated in this program. The memory span significantly improved, according to the authors. Then, Comblain improved this

approach by suggesting 30-minute weekly individual training sessions with people who have Down syndrome (with increasing difficulty). Bussy et al. showed a lengthening of the verbal span and an expansion of the passive vocabulary using this methodical technique. In the metacognitive program "Découvrez vos capacités, rEalisez vos possibilités, pLanifiez votre démarche, soyez créatiFs" (DELF), is a metacognitive program that seeks to identify a subject's strengths and showcase the individual. When included in a regular educational program, deliberative thinking skills are enhanced. This curriculum is utilized in groups and teaches more specific methods, such as how to better use WM so as not to overload memory, as well as metacognitive strategies (anticipation, planning, and control). In virtual reality, virtual reality's potential for treating people with intellectual impairments has received less attention in research. Rose et al. made the point that active exploration using a joystick in a virtual world is more relevant than passive exploration accomplished by simple observation. The respondents were able to better retain the environment's spatial information by using a joystick. Thus, the creation of virtual reality applications would let users enhance their spatial abilities. In the Attentional Program, Galbiati et al. (2009) suggested treatment for kids and teens with traumatic brain injuries who are also dealing with attentional problems and minor intellectual disability and are between the ages of 6 and 18 years old. Utilizing metacognitive techniques, the program utilized targeted attentional capacities. Four 45-minute individual weekly meetings with a therapist were part of the six-month course of treatment. The tasks were computerized for 30 minutes, paper, and pencil for 15 minutes each during the sessions. Daily progress was made by the participants in terms of their ability to focus and adjust. On the other hand, according to Harvey and Bowie (2012), there are other programs for CR including "Cognitus & Moi", "COG PAC" and "Posit-Science Brain Fitness program", "Cognitive remediation therapy", "Integrated psychological treatment" and "Cognitive adaptation training".

7–1–Cognitus & Moi

Cognitus & Moi was developed in France through the collaboration between the GénoPsy center, the EDR-Psy research team (headed by Pr. Nicolas Franck), and the SBT Company (headed by Pr. F. Tarpin-Bernard), by trained therapists for CR. The "Cognitus & Moi" program targets attentional and visuospatial functions. Cognitive goals are embedded in two different modules: attention (hearing attention, visual attention, and divided attention, double attentional tasks) and visuospatial (eye tracking/gaze direction, spatial orientation, visuospatial memory, mental imagery, and visuospatial construction), and the level of these modules is chosen according to the child's key difficulties. Therapists utilize methods that are effective in helping people with cognitive disorders recover. "Cognitus & Moi" targets a single-impaired cognitive area. Children aged 5 to 13 who may or may not have intellectual disabilities are the target audience. The program's cartoon character Cognitus serves as its mascot. (To find out more, see Demily et al., 2016).

7–2–COG PAC

In Germany, Marker Software created the "COG PAC" system. The executive functioning, processing speed, and other skills like WM are stimulated by a variety of diverse visually presented stimuli in this program. Since there are several distinct exercises, some of which (such as identifying currency) do not seem to have the ability to improve CFs, this top-down software must be personalized to each user.

7–3–Posit-Science Brain Fitness program

Numerous cognitive-improving modules, such as auditory and visual exercises, are offered by the "Posit-Science Brain Fitness program" There is also a module for driving simulation. The auditory training routines, which were created using knowledge about the anatomy and operation of the auditory cortex, were employed in earlier investigations of this program with schizophrenia patients. This strategy is designed to enhance perceptual signal-to-noise processing.

7–4–Cognitive remediation therapy (CRT)

By Delahunty and Morice, CRT was created. It consists of three components that each target WM, planning, and cognitive flexibility. Individual sessions for remediation are held, and exercises using paper and pencil are used. The therapist's job is to support patients in creating their own plans for resolving issues while offering suggestions for action when necessary. In terms of WM and cognitive flexibility, this program's effectiveness has been demonstrated in adults and adolescents, respectively. According to new research, CRT has been linked to long-

lasting enhancements in memory and social functioning. The topic of social cognition is not covered by this simple-to-use tool, which is designed for executive processes. As a result, at the very least, support psychotherapy must finish its activities. (Demily & Franck, 2008)

7–5–Integrated psychological treatment

In Bern, Brenner and Volker Roder created the first treatment regimen for schizophrenia known as IPT (Switzerland). It incorporates social skills instruction and cognitive rehabilitation. IPT consists of five subprograms: cognitive differentiation, social perception, verbal communication, and social skills training. IPT enhances the encoding abilities, executive functions, personal autonomy, and interpersonal relationships of schizophrenia patients. Patients who get cognitive rehabilitation through IPT are taught abstraction, conceptual organization, fundamental perception, and communication techniques. IPT also promotes long-lasting improvement in patients' mental health. (Demily & Franck, 2008)

7–6–Cognitive adaptation training

Behavioral principles are set up to cue appropriate behaviors, discourage distraction, and maintain goal-directed activity. The training uses environmental support and adaptations in association with target behaviors. Adaptations are customized for specific cognitive deficits in attention, memory, and fine motor control. Treatment strategies imply an assessment of cognitive functioning, behavior, and the environment. CAT is not a CR program but rather a compensatory method. The goal of this program is to improve functional outcomes rather than cognitive functioning. (Demily & Franck, 2008)

8–The effectiveness of CRT

CR is a useful and practical tool for the therapist and patient as it focuses on the cognitive-functional aspect. CR is a flexible tool that focuses on CFs, psychosocial abilities, adaptation, and occupational aspects. It depends on neuroplasticity, cognitive flexibility, the brain's ability to train and learn, and its impact on the nervous system. According to Harvey & Bowie (2012), Additional research has revealed that CR may have an impact on the central nervous system (CNS). For instance, Vinogradov et al (2009) reported that patients who received CR manifested an improvement in their serum levels of brain-derived neurotrophic factor (BDNF). Additional studies have shown that CR has potential central nervous system (CNS) effects. Patients receiving the inactive treatment did not change at all. In a study of CR in dyslexia, according to Keller and Just's 2009 research, a structured intervention designed to boost reading also leads to structural brain changes. Cases that got the therapy and had positive treatment responses showed an improvement in regional fractional anisotropy. As a result, following remediation treatment, the cortical white matter became more cohesive and structured. Much evidence has proven their effectiveness, especially in the field of severe mental illness in general and schizophrenia in particular, in the cognitive, psychological, social, adaptive, and professional aspects. CR has a direct and positive impact on the neurocognitive, psychological, social, and functional aspects of schizophrenia. CR is considered the primary reference for the application of CR in computerized and non-computerized programs. The majority of studies found that schizophrenics' executive functions, CFs, and metacognitive strategies improved after exposure to CR. A CR program based on metacognition had a positive effect on the cognitive and EFs of schizophrenics. CR stimulates and interacts with patients more. (Choi et al., 2018; Cella et al., 2019).

9–Discussion

CRT is characterized as one of the therapeutic interventions in cognitive training and rehabilitation directed at enhancing neurocognitive and metacognitive abilities and social functioning, including social cognition, by enhancing strong cognitive capability to recover impairments' capacities or focusing on impairments' abilities to improve their performance. CRT is based on the perspective of neurocognitive plasticity and the ability of the brain to compensate and multifunction, and that behavioral learning makes the brain capable of reorganizing automatically, as assumed by Goldstein (1939) and Alexander Luria (1948, 1966, 1973), where a different region can take over the function of the damaged region and the patient can be taught to use strategies in place of the ones he was learning, and a treatment plan can be developed to develop and teach alternative functional systems. Taking into consideration that the methods of CR are based on the neuropsychological basis of brain function, neuroplasticity, and brain plasticity, cognitive training is based on brain neurological changes arising from the exercises and tasks provided by CRT. What distinguishes

CRT approaches is that they are based on an orientation to rehabilitate the cognitive impairments of patients with psychiatric diseases. Based on information processing and cognitive functioning, as well as their neurocognitive, psychosocial, and functional abilities, these approaches are based on the educational environment and new stimuli to help patients learn new strategies, adapt, and be flexible to new situations in daily life. By relying on adaptive and stimulating behaviors for recovery, participation in educational activities, reinforcement of learning, and the provision of training tasks, many skills are acquired at one time and presented in the context of real life with the use of a variety of learning strategies such as error-free learning, behavioral reinforcement, group learning, and the acquisition of skills in a new and changing environment with a focus on tasks, gradation in the level of difficulty of exercises, and intensive and regular practice on tasks. On the other hand, therapeutic interventions for cognitive rehabilitation are computerized programs that include interactive exercises that focus on executive and cognitive functions, metacognitive skills, and functional social performance, based on gradations in the difficulty of exercises and their simulation of real life. This contributes to training and rehabilitating patients to adapt to and integrate into real life. In terms of the future of CRT, it is still emerging in therapeutic interventions, and it needs more research and application. According to Wykes's writing in Nature (2010), a more individualized strategy is the way of the future for CRT. She advises stratifying study participants in order to determine the approaches that are most successful given their unique characteristics, such as age or learning style. An ideal remediation program would be created specifically for each person. Investigating how CRT affects brain function may involve using biomarkers or brain imaging. Galletly & Rigby (2013) assume that the development of successful programs that include CRT with psychosocial and vocational rehabilitation is most likely where CRT's clinical future lies. The most likely scenario for CRT's future is its integration with psychological and vocational rehabilitation. Future studies should continue to examine the best CRT method and assess its effects on overall functional outcomes. Clinical programs presented by clinicians are largely utilized for research, while computerized programs are more likely to be used in clinical practice. When the outcomes of clinician-delivered programs are compared to those of computerized CRT programs, it appears that, despite the differences in outcome metrics, the computerized programs are typically just as successful.

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التأهيل المعرفي: نظرة عامة

ملخص

ساهمت التطورات في علم النفس العصبي والنتائج والأدلة التجريبية في الاصابات الدماغية العصبية بشكل كبير في ظهور التدخلات العلاجية للجانب العصبي والنفسي والمعرفي. من خلال هذا نشأ مفهوم التأهيل المعرفي استجابة للاضطرابات المعرفية التي ظهرت لدى المرضى خاصة في ميدان الامراض العصبية العقلية، بالإضافة الى الحاجة الى تحسين القدرات المعرفية لديهم. في هذه الدراسة سنناقش التأهيل المعرفي كمقاربة علاجية من خلال تقديم المفهوم وتحديد نظرة عامة وتقديم أهم الأساليب والبرامج المستخدمة في هذا العلاج، وسرد بعض نتائج الدراسات المتعلقة به.

الكلمات المفتاحية

التأهيل المعرفي
العلاج المعرفي
العجز المعرفي
الامراض العصبية العقلية
التدخل العلاجي

Thérapie de la remédiation cognitive : Revue générale

Résumé

Le développement de la neuropsychologie et les résultats expérimentaux sur les lésions cérébrales et neurologiques ont contribué de manière significative à l'émergence d'interventions neuropsychologiques et cognitives. Le concept de remédiation cognitive a été établi en réponse à la déficience cognitive observée chez les patients et pour améliorer les capacités cognitives. Dans cette étude, nous discuterons de la remédiation cognitive en introduisant le concept et en déterminant un aperçu de la remédiation cognitive, en fournissant les approches et les programmes les plus importants utilisés dans la remédiation cognitive.

Mots clés

remédiation cognitive
thérapie cognitive
déficit cognitif
maladies neuropsychiatrique
intervention

تضارب المصالح

يعلن المؤلف (المؤلفون) لا تضارب في المصالح

Competing interests

The author(s) declare no competing interests