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COGNITIVE REMEDIATION THERAPY TOOLBOX DEVELOPMENT FOR TURKISH POPULATION

TÜRK ÖRNEKLEMİ İÇİN HAZIRLANAN BİR BİLGİSAYARLI BİLİŞSEL ONARIM TERAPİ PROGRAMI

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Dear Editor,

Cognitive remediation therapy (CRT) dates back to 1970s (Meichenbaum and Cameron 1973) and since then it is used for the rehabilitation of the cognitive disfunctioning of several clinical conditions such as schizophrenia (Kluwe-Schiavon et al., 2013; Anaya et al., 2012), mood disorders (Bowie et al., 2013) eating disorders (Tchanturia and Lock, 2011), brain tumor related cognitive deficits (Sacks-Zimmerman et al., 2015) and attention deficits (Wender et al., 2001).

Wykes defines CRT as "A number of different methods of teaching "thinking" skills." CRT is a type of therapy that focuses on the so called 'cold' aspects of cognition such as attention, memory and decision making rather than the 'warm' aspects like emotions (Wykes and van der Gaag, 2001). The main aim of the therapy is to teach the patient a couple of problem solving strategies which can be adapted to daily life situations and makes it easier for the patient to cope with daily life problems. For a long while the materials used for the therapy were pencil and paper, and recently computer based remediation therapy started taking the stage especially because the motivation for the therapy is a main factor for benefitting it (Saperstein and Medalia, 2016) and computer based exercises seem to be more interesting for the patient then paper based ones.

A main factor of benefitting any kind of therapy is its relevance to the culture that it is applied to. For that reason, in our project named "Beynini Çalıştır Kendini Yenile", which started almost a year ago and is supported by Istanbul Development Agency, after reviewing the literature for the CRT applications abroad, especially the computer-based versions, we developed a CRT toolbox suitable for local culture.

Reha-bil exercises were developed focusing on some main cognitive functions such as attention, memory, decision making, visiospatial abilities and their sub categories: sustained attention, selective attention, short-term memory, working memory, planning, alternating attention, impulse inhibition. For each sub-category, our team had brain storming sessions for finding an original computer-game idea with which the use of that specific cognitive function will be needed and several strategies about the effective use of that function can be discussed. Another major indicator of the game creation process was it is relevance of daily life situations. We created probably scenarios for the exercises such as selecting the rotten fruits from several others, preparing the order of the customer in a fast-food restaurant. By this way we came up with 20 original exercises, all with 5 levels of difficulty and can easily be related to daily-life conditions. The exercises were designed in 3D using Unity 3D game engine. After developing the exercises, we came up with a 16 session CRT program.

Scaffolding, massed practice, errorless learning, positive reinforcement are the main techniques that are used in CRT application and we embedded all these techniques in our exercises.

Scaffolding means starting the exercises at the level appropriate for the participant and adding the bricks of cognitive functions one by one by increasing the level and complexity of the exercise. Therefore, each exercise in Reha-bil program has 5 levels that differ in terms of

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difficulty and complexity. In addition, while most of our exercises focus on different aspects of cognition, a few of them focuses on more than one aspect (so to say, attention, memory and decision making at the same time) so that at the last sessions of the therapy we can help the patient to integrate the steps of the stair. Massed practice helps the patient to digest the strategies learned for solving problems. For that, each level has at least 5 trials or a minimum of 2 minutes of application.

In our everyday life, we tend to learn from our mistakes. However, in CRT, the main aim is to teach the patient the strategies without making errors, so the correct responses are learned implicitly. For errorless learning to take place, we designed the exercises to minimize the risk of error. At the beginning of each exercise, we have slides which explain the exercise in detail and the patient goes over all the slides with the help of the therapist. At the end of the slides, the patient is asked to recall and tell the therapist what the exercise is about, to be sure the exercise was understood well. In addition, our exercises were designed in a way that the therapist can interfere in the exercise where s/he sees a possibility of error making. S/he can pause the exercise, discuss it with the patient, help the patient find an appropriate strategy for the exercise and makes the patient continue when s/he is sure that the possibility of making an error is minimized. Also, because these program will be shared online with people to use it on their own (without a therapist), in each exercise after a reasonable number of errors, the user is asked if s/he wants to see the instruction slides again before continuing. Positive reinforcement is also a main factor in implicit learning as is generously used in CRT application. The computer program also has auditory and visual stimuli for positive reinforcement such as applause sound and check mark.

To sum up, Reha-bil CRT toolbox is a ready-to-use computer based, 3D exercise program that is relevant for Turkish population and was designed sensitive to the application of main techniques used in CRT therapy: scaffolding, massed practice, errorless learning, positive reinforcement.

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