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COGNITIVE-BEHAVIORAL HYPNOTHERAPY AUGMENTED WITH VIRTUAL REALITY EXPOSURE IN FLIGHT PHOBIA: A CASE STUDY

Viorel LUPU[1], Silviu MATU[2], Izabela Ramona LUPU[3]*

[1] Department of Psychiatry & Child & Adolescent Psychiatry, I. Haţieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania;
[2] Department of Clinical Psychology and Psychotherapy, Babeș-Bolyai University, Cluj-Napoca, Romania;
[3] I. Hațieganu School, Cluj-Napoca, Romania

Abstract
This paper presents a case study of a 40-year old patient suffering from flight anxiety, treated using a brief cognitive-behavioral intervention augmented by virtual reality exposure therapy and by hypnotherapy. The treatment was delivered in an outpatient setting in 6 weekly sessions. The main treatment approach comprised systematic desensitization conducted *in vitro* (imaginary), during hypnosis and self-hypnosis sessions, as well as *in virtuo* (in virtual reality). To challenge catastrophic thoughts related to flight and to increase frustration tolerance, the patient was thought the ABC model and cognitive restructuring techniques derived from Rational Emotive Behavioral Therapy. Respiration techniques, hypnosis and self-hypnosis techniques were also applied in order to improve sleep quality. The clinical evolution of patient was positive.

Keywords**:** flight anxiety; hypnotherapy; self-hypnosis; virtual reality exposure therapy; Rational Emotive Behavioral Therapy

Introduction

The lifetime prevalence of simple phobia in the general population is over 10%. This mental health problem is more common in females, which account for up to 70% of the clinical cases (Ladouceur, Fontaine, & Cottraux, 1993). Patients with simple phobia have a limited daily activity and report lower levels of quality of life. In USA, phobias are considered to be one of the most frequent psychiatric

* Correspondence concerning this article should be addressed to:
E-mail: violupu14@yahoo.com

disorders (Goldberg, 2001). Most common simple phobias are those related to insects, mice, reptiles, water and other animals, like dogs. Most patients with phobias present somatic and physiological symptoms, such as pallor, tachycardia, sweating, difficulty breathing and hyperventilation, right before and during the encounter with the feared stimuli or situation. Even the mental representation or watching a TV program that reminds of the situational trigger can generate intense anxious responses. That is why the patient will avoid the phobic situations, which in turn will contribute to the maintenance of the symptomatology. This is the real struggle in the cases of clients suffering from clinically severe types of phobia. Basic phobias are relatively simply to treat, with 90% of them improving greatly or even disappearing after exposure methods (Lupu, 2012). Systematic desensitization, modeling participation and in vivo exposure are very effective treatments in phobic symptomatology (Cottraux, 1990). Some authors consider that whenever possible, it is best to apply directly *in vivo* systematic desensitization methods instead of using imaginary desensitization in the initial stages of the psychological treatment. Being able to successfully manage a real-life situation gives the subject a greater satisfaction and more self-confidence (Holdevici, 1998). In this context, the therapist and the client have to build together a hierarchy of feared situations, in order to conduct gradual exposure. However, direct exposure even to the situations at the bottom of this hierarchy might prove to be difficult in some cases. For example, in the case of flight phobias, the feared stimulus is not readily available, and *in vivo* exposure might imply additional costs.

Flight phobia is a relatively common mental health problem and has negative impact on the quality of life of patients suffering from this condition. The traditional form of treatment is time-consuming, expensive and could compromise the patient confidentiality. Classical exposure implies usually several trips to the airport and flights done by both the patient and the therapist. Beside high costs, this technique also poses a danger for the confidentiality of the therapeutic intervention. Virtual reality exposure therapy (VRET) is a technologically enhanced approach to exposure treatment that might overcome these limitations (Krijn, Emmelkamp, Olafsson, & Biemond, 2004; Rizzo, & Kim, 2005), as it can be done directly from the therapist's office, at minimum costs. During the session, the patient will receive a special equipment which has the ability to transpose him or her right in the middle of the stressful event. VRET is based on cognitive-behavioral therapy (CBT) principles and it presumes real-time exposure in a 3D virtual world. With the help of a few special devices (headphones, glasses, gloves, etc.) the patient acquires the feeling that he is physically present in the computer-generated environment. Moreover, he or she can touch or move objects, hear, and depending of the equipment, feel smells or develop sensitive sensations. The moves of the patient are transmitted to computer through using different sensors (e.g., trackers) and represented in real-time in the virtual environment, which increases the level of presence in the virtual world (David, Matu, & David, 2013). Empirical evidence indicates that using virtual reality as a tool to conduct exposure in flight anxiety is

an efficacious intervention (Cardoș, David & David, 2017). Moreover, virtual reality has been successfully integrated with other techniques derived from CBT, such as hypnosis (Enea, Dafinoiu, Opriş, & David, 2014), make it a flexible and viable tool to provide interventions that are tailored to the patients' needs and case requirements.

Further we will present a cognitive-behavioral intervention in a case of flight phobia for a female patient at the age of 40 years old, according to methodology proposed by David and McMahon (2001).

Case study

Case history, clinical conceptualization and treatment.

Case history.

"Maria" is a 40 years old client, with higher education, living in a big Transylvanian city, where she lives together with her husband and her 8 years old son. She contacted our office soliciting psychotherapy sessions for flight phobia. The psychotherapeutic approach was done in an outpatient setting, within 6 therapy sessions, carried out throughout 1 session each week. Between the forth and the sixth session we included one meeting during which we applied 2 consecutive exposure procedures using a Virtual Reality (VR) soft specially designed for the treatment of flight phobia.

The symptomatic manifestations of the clients' phobia included increased levels of fear related to air travel, expressed through excessive anxiety (emotional symptoms) even in response to thoughts related to the idea of flight. These emotional reactions were consistently accompanied by tingling sensations in her hands, tremble, headaches, hasty respiration (hyperventilation), and muscular tightness (physiological symptoms). In response to these unpleasant physiological symptoms that were perceived as being out of her control, she cancelled her flight to her brother, which lives in Canada and who invited her there every year for the last 5 years (behavioral symptoms).

She wrongly thought that air travel represents a great dangerous, and as a consequence she will experience a state of sickness, and eventually she will feel really ashamed of the whole situation (cognitive symptoms). These symptoms started approximately 5 years ago, after she heard a news about a plane crash, but worsened in the last three months, after her brother renewed this invitation and once more, she had the chance to fly to Canada.

Due to the problems described above, lately "Maria" presented irritability, low frustration tolerance and insomnia. Regarding her personal physiological and medical pathological history, there were no special concerns.

As a psycho-type, Maria described herself as an emotive person, sociable and extroverted. After the psychiatric interview, she obtained a Phobic anxiety

disorder diagnosis (Specific phobia- flight phobia), code 325 (F40.2), according to WHO's classification criteria (ICD-10) (1992).

This disorder appeared on the background of a personality with anxious notes, and of a good cognitive functioning. Before starting the therapy, we evaluated her anxious and depressive symptoms using the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). She obtained a score of 14 on the anxiety scale and a score of 5 on the depression scale, as values above 11 indicate significant levels of psychological impairment.

Conceptualization.

Precipitating factors. The stress related to the fact that she was once again invited to fly with the plane to her brother in Canada, determined indisputably, an increase in levels of anxious symptoms, which lasted for approximately five years now.

Current cognitions and behaviors. The current and most stressful problem for "Maria" was the possibility of air travel, which caused palpitations, hyperventilation, trembling and general somatic discomfort. In the same time, the following automatic thoughts appeared: "The flight with the plane is so dangerous and I will get sick and I will be ashamed."
Consequently, "Maria" resorted to avoiding the plane flight for a period of 5 years.

Longitudinal analysis of cognitions and behavior. "Maria" was raised in a family in which the mother exhibited anxious and overprotective behaviors. From an early age, the client displayed an adequate behavior in kindergarten, being very sociable. The traumatic event, respectively hearing the news about the plane crash with 2 months before her flight to Canada, initiated an avoidance behavior, which led her to cancel her flight.

Aid elements for therapy and negative reinforcements. "Maria" has a good intellect and an excellent somatic health. She started to present symptoms of flight phobia 5 years ago, after hearing a news about a plane crash. The coping mechanism used by her was avoiding air travel.

Work hypothesis. "Maria" presented flight phobia for 5 years, reactivated with 3 months before the moment of our first evaluation, by the presence of the erroneous thoughts, linked to generalization of the idea that air travel is dangerous. In addition, her mothers' anxious personality tendencies contributed both to the induction and to the maintenance of her symptomatology.

Treatment plan

- ***List of problems:*** (1) Maria's plane flight phobia; (2) Irritability and low frustration tolerance; (3) Sleep onset insomnia
- ***Treatment objectives****:* (1) Eliminating the plane flight phobia, including the erroneous thoughts about air travel; (2) Increasing frustration tolerance; (3) Normalizing sleep

- ***Therapeutic intervention plan**:* In the initial phases of the psychological treatment, we aimed to eliminate flight phobia and correcting the erroneous thoughts concerning the dangers of traveling by plane.

In order to reduce the symptoms of flight phobia, we started by applying desensitization techniques. First, we started with imaginary exposure, over several hypnosis sessions, combined with self-hypnosis sessions. We further exposed her to a VR environment, using a specially designed soft exclusively created for the treatment of flight phobia. In our last session, we used hypnosis for the consolidations of the therapeutic results. To eliminate catastrophic thoughts related to the possibility of developing health problems as a result of air travel, we used Ellis' ABC model (1994), applied in several session of Rational Emotive Behavioral Therapy. We applied the same approach to increase frustration tolerance.

To improve sleep quality, we used breath control exercises, hypnosis and self-hypnosis. The therapy consisted in 6 sessions, five of them used for delivering cognitive-behavioral hypnotherapy and one session for implementing exposure to flight in the VR environment.

First session

In the first session, we discussed with „Maria" about the problems that determined her to consider therapy, such as: aerophobia, irritability, low frustration tolerance and sleep onset insomnia. For HADS (Zigmond & Snait, 1983) we found a score of 14 for anxiety and 5 for depression. To appreciate her flight fear, we applied a scale ranging from 0 (lack of fear) to 10 (excessive fear). She rated her fear at an intensity of 10.

We explained to „Maria" the correlation between fear – emotional negative tensions and hyperventilation together with the other symptoms that bothered her when she was imagining the plane flight (tingling, trembling, palpitations, headache, and irritability). Once activated, thea fear prompted these symptoms, which in turn, accentuated the fear, creating a vicious cycle. Then the client was encouraged to hyperventilate for 2 minutes and to share with us the sensations that she felt, which, in great measure, overlapped with those occurring when she was imagining the plane flight. Further, she was taught to breathe in 3 steps, each 4 seconds long: forced inhalation, maintaining the air using the Valsalva maneuver and forced exhalation. She was taught that by practicing these exercises she would be able to control the unpleasant sensations promptly. Until the next session, her homework was to exercise three times per day the breath control exercise learnt during this therapy session.

Second session

We explained to the patient the ABC model of Albert Ellis (1994), the founder of Rational - Emotive Behavioral Therapy, insisting on the importance of catastrophic cognitions in generating phobias in general and flight phobia in particular.

We asked the patient to do a ranking of the most terrible things that could happen to her, on a scale of 0 to 10 (10 being the most terrible thing possible). He considered the following:

- The death of her child, parents or husband – 10
- The illness of her child, parents or husband – 8
- Her own sickness state – 7
- Flight phobia – 6

We relativized the catastrophic idea of a plane flight, showing her that this possibility is not such a terrible thing, but rather a worrying thing and that a plane flight is the safest type of transport invented so far in the whole humankind, statistically speaking.

The meeting ended in a hypnosis session. The induction was made through three three-step breaths, followed by progressive muscular relaxation and then by the blackboard method (Goldberg, 2000), applied initially as a method of deepening the trance („Write on an imaginary blackboard, successively, the letters from A to Z, and while you wipe it with the sponge, you are more and more relaxed") and then as a method of therapeutic intervention and problem solving, including strengthening the self („Please write on the blackboard the following words, each one under the other: disease, fear of flight, nervousness, low frustration tolerance, insomnia, getting sick, which you will then erase with the sponge and relax. Now please write the words: health, courage, self-control, tolerance, peaceful sleep and under those: I will succeed, I will succeed, I will succeed...").

After returning from the trance, we discussed with the patient about the sensations that she felt during hypnosis, which she admitted that were very pleasant. As homework, we prescribed her to apply the blackboard exercise before bedtime, preceded by a three-step breathing exercise, arguing that that these techniques will facilitate her sleep.

Third session

At the beginning of the session, „Maria" reported the fact that she slept very well, feeling really rested after practicing the blackboard exercise, without needing hypnotic medication. Then we started creating a list of situations concerning a real or imaginary plane flight, evaluating the level of distress associated with them on a 0 to 10 scale (10 representing the maximum level of distress). She reported in a decreasing order the following scores:

- 10 for boarding a plane
- 8 for the sight of a plane right in front of her
- 6 for the sight of a plane ticket
- 4 for the appearance of plane on the TV screen
- 2 for a hint related to air travel

We continued the imaginary exposure, as follows: we started with the three-steps breathing exercise; we induced the hypnotic trance through Jacobson's progressive muscular relaxation, followed by a deepening of the trance by counting

from 0 to 20, giving suggestions of profound relaxation, followed by successively imagining the stressful situations listed from 2 to 6. Whenever she experienced restlessness during the imaginary exposure, we gave her the suggestions of calm and relaxation, and we continued with the exposure procedures. After coming out of trance, „Maria" reported a decrease in fear intensity for the situations listed above (for example – 6 the sight of a plane ticket decreased to 4, etc.). Her homework assignment was to continue with the blackboard exercise and with the three-step breathing exercise.

Forth session

We explained to "Maria" that she would continue the imaginary exposure with the help of the VR. We proceeded to a hypnosis session in which we administered positive suggestions regarding healing and raising self-esteem. In addition, we gave her the suggestion that she will be able to tolerate the contact with the plane. We will further presented a fragment from the hypnosis session where she was given the following suggestions: "*You are calm and relaxed… You see a big plane in front of you… You continue to feel relaxed... Imagine with all your strength that you lean your hands forwards…and while you are doing that the plane in front of you becomes smaller… smaller… smaller… until it is as small as a toy, and you can make it your friend… You are calm and relaxed."*

After coming out of the trance, „Maria" reported that she decided to view the plane as her friend, and she perceived it as inoffensive.
As homework, she had to o exercise self-hypnosis with the blackboard method, followed by an imagery exposure technique similar to the one practiced during the hypnosis session.

Fifth session

In this session, "Maria" was the subject of a two successive exposure procedures to a plane flight through the VR soft owned by AVALON Research Center from the Faculty of Psychology and Educational Science within the pale of the International Institute of Advance Studies of Psychotherapy and Applied Mental Health of Babes-Bolyai University.

The Institute owns a Robotic Psychotherapy and Virtual Reality platform named PsyTech-Matrix Platform. During the session, a very important fact was noticed, namely that the client was able to calm herself while she was staring through the plane window in the virtual environment.

Sixt Session

At the beginning of the session, „Maria" reported the fact that she managed to do very well the self-hypnosis and the imaginary exposure exercises, feeling very low levels of distress. She received a positive reinforcement from her therapist, after which she was asked to look out the plane's window during the flight to Canada. A new hypnosis session was done, in which the hypnotic induction was achieved with the help of special relaxation music. On this musical

background, positive suggestions were offered in order to maintain the favorable results of therapy. We recommended the client to and to continue the self-hypnosis exercises.

We administered her again the HADS and she obtained the following scores: 3 for anxiety and a 2 for depression. These scores certified the improvement of her psychological state. After this last session, we recommended her to continue at home with the self-hypnosis exercises and „Maria" was now able to successfully air travel, and her flight phobia symptoms were remitted.

Evolution

After all the six therapy sessions, the problems that were present at the beginning of the therapy disappeared. She managed to control her anxiety concerning the plane flight and she succeed to arrive in Canada. She confessed that during the flight she constantly look through the plane's window, admiring the sight of Greenland. These benefic results were maintained in time, even when she returned home.

Conclusions

The presented case illustrates how combining hypnotherapy, self-hypnotic techniques with Rational-Emotive and Behavioural Therapy and desensitization procedures in the form of imaginary exposure and exposure to virtual reality environments specially designed for flight simulations, is effective in treating symptoms of flight phobia.

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