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## Virtual Reality Hypnosis: a New Intervention Strategy in Quitting Smoking

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### Abstract

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Quitting smoking is a topic that has the attention of healthcare professionals for a long time, because smoking causes a number of deaths among active and passive smokers every year.

Virtual reality began to be used more and more and not only for recreation but also in research in medicine, education and psychology. Until now it has been found that can be a useful technique in the treatment of PTSD, phobias, pain management, and smoking.

On the other hand, hypnosis has demonstrated over time that can be effective in different areas of intervention, including smoking cessation.

This article aims to present a concept that integrates both hypnosis and virtual reality, namely Virtual Reality Hypnosis. We will present what are the areas in which it was used, what are the advantages and limitations.

We will also explore the possibility of using Virtual Reality Hypnosis in an intervention program for smokers who want to quit smoking.

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**Keywords:** Virtual reality; hypnosis; smoking; Virtual Reality Hypnosis.

## **1. Introduction**

It is well known that smoking has many adverse health effects like various types of cancer, cardiovascular diseases and infertility. For this reason, health experts are trying to find effective ways to help smokers to give up smoking, whether we refer to pharmacotherapy, psychological interventions or interventions mixed.

In Romania, the prevalence of tobacco consumption is 27% according to the Eurobarometer from 2014, thus registering a decrease of 3% compared to 2012.

Among smokers who tried to quit, 60% had tried without any assistance, 6%, they turned to NRT, 4% have turned to specialist doctors and 6% have tried electronic cigarette. Consequently, it is necessary to be implemented as many intervention programs to help them quit and remain abstinent.

In this article we bring into discussion a psychological method that combines classical techniques such as hypnosis, with current technologies, namely virtual reality.

## **2. Virtual Reality**

Virtual reality refers to artificial environments created on a computer that provides a simulation of reality so successful that the user can get almost real impression of physical presence, both in real places, and in imaginary places.

A virtual environment is a digital space where the user's movements are tracked and surroundings are reproduced by these movements (Fox, Arena, Bailenson, 2009). The role of a virtual environment is to replace real-life stimuli with digital ones and to ensure that the user's experience is immersive and more realistic.

Since the 1990s, social scientists have started to be interested in the applicability of virtual reality (Loomis, 1992). One of the goals of using virtual reality is to provide a meeting place for people without day constraints of the physical world (Lanier, 1992). Given that both environments, real life environments and fiction inspired environments, can be recreated through virtual reality, people can experience a wide range of social and psychological phenomena.

Until now, some researches were conducted in order to test the effectiveness of using virtual reality to treat the following conditions:

- Fear of height - Hodges et al (1995), Emmelkamp et al (2002);
- Fear of flight - North, North, & Coble (1997); Rothbaum et al (1996); Rothbaum, Hodges, Anderson, Price & Smith (2002).
- Fear of driving- Wald, Taylor (2000)
- PTSD - Rothbaum, Hodges, Alarcon et al. (1999).
- Eating disorders - Riva et al (2001).
- Sexual dysfunctions - Optale, Nasta, Marin& Ipianon (2003).
- ADHD - Rizzo et al. (2000).
- Pain management –Hoffman et al (2011).
- Panic disorder and agoraphobia- Vincelli et al. (2003).
- Social anxiety - Pertaub, Slater, & Barker (2001).

The studies developed in nicotine dependence (Baumann, Sayette, 2006; Bordnick, Carter, 2008; Rodrigues, Valverde, Maldonado, Ferrer-Garcia, Secades-Villa, 2012) concluded that virtual reality is able to recreate situations and everyday environments that are associated with smoking. These environments can be used in intervention programs that are based on cue exposure therapy.

The argument for using exposure to stimuli to nicotine addiction is based on classical conditioning learning model. Nicotine is the unconditional stimulus and the effects of nicotine are the unconditioned responses. The conditions or contexts in which a person smokes very often become conditioned stimuli that determine the appearance of conditioned responses, and this leads to craving and nicotine consumption. They use cue exposure therapy, which involves a repeated exposure to stimuli which were previously associated with an addiction in order to extinct the conditioned response to those stimuli.

### **3. Hypnosis**

Lately, more and more people are opened to try hypnosis in order to overcome some difficulties in everyday life.

An assessment of hypnosis as a clinical intervention supported empirically (Lynn, Kirsch, Barabasz, Cardena & Patterson, 2000) concluded that the hypnotics' procedures are very effective and have earned a place among new treatments due to the reduced time and the cost-effectiveness. Regarding nicotine addiction, several approaches built on the principle of redrafting commitment to life and health were used. Overall, the success rate using hypnosis interventions is increased compared to the queue or the control group (Green, Lynn, 2000).

H. Spiegel (1970) was the first who used hypnosis for smokers who wanted to quit the habit. He used an approach based on one session of hypnosis, during which he offered patients the opportunity to place the problem in a new perspective.

Hypnosis used to treat nicotine addiction involves inducing a certain state of relaxation for the smoker who subsequently receives some therapeutic suggestions. These may include suggestions that strengthen the health benefits of quitting smoking, can change individual beliefs regarding smoking and improve their ability to cope with nicotine cravings.

A Meta - analysis conducted by Green, Lynn, and Montgomery (2008) investigated the efficacy of hypnosis in smoking cessation. The authors included 24 studies with a total of 5704 participants and the mean of participants who have managed to be abstinent from interventions based hypnotherapy was 26.3%. The results of this meta-analysis suggest that hypnosis can be considered an effective method to quit smoking and encourage the development and implementation of as many studies in this field.

### **4. Virtual Reality Hypnosis**

Virtual Reality Hypnosis emerged from the desire to use 3D technology in order to guide the person in a similar manner like in traditional hypnosis. The biggest advantage of virtual reality hypnosis is that the exposure to visual stimuli is easier compared to traditional hypnosis in which participants have to imagine all the stimuli.

Since 1995, Grant and Nash have used for the first time the computer assisted hypnosis in order to test the level of hypnotisability and they used in their study a two-dimensional technology (Grant, Nash, 1995).

As 3D technologies are advancing, experts have considered using virtual reality hypnosis because it has several advantages (Askay, Patterson, Sharar, 2009):

- in this type of hypnosis, there is no need for the presence of a specialized hypnotherapist
- this type of hypnosis captures the attention of those who have problems with imagination and can create the state of presence much easier
- this form of hypnosis could have several outcomes in people with low hypnotisability than traditional hypnosis
- this form of hypnosis could be used in people with hearing impairments, who can receive a subtitle on the screen

It is important to remember that virtual reality hypnosis does not replace traditional hypnosis, and in complicated clinical situations, the presence of a specialized hypnotherapist is mandatory (Askay, Patterson, Sharar, 2009).

Virtual reality hypnosis was used for the first time by Patterson, Tininenko, Schmidt and Sharan (2004) in the case of a man who had burns on 55% of the body. The patient has never been exposed to hypnosis sessions and after applying the Stanford Hypnotic Clinical Scale, he obtained a medium level of hypnotisability. After using virtual reality hypnosis, the patient reported decreases on pain level, reducing anxiety and a positive, subjective experience with the virtual reality technology.

From this case study, Patterson, Wiechman, Jensen and Sharar (2006) used virtual reality hypnosis in pain management for 13 people with burns and the results were favourable, meaning that they obtained decrease in worst pain scores, in the time that patients spent thinking about their pain and in anxiety scores.

Consequently, virtual reality hypnosis is useful in the management of anxiety in patients with burns, which means that this procedure can be useful for other anxiety disorders (Patterson et al., 2006).

Virtual reality hypnosis could be used as an interventional procedure in cases where the cue-exposure therapy with through virtual reality was tested and the results obtained were encouraging, like: anxiety, phobias, eating disorders, drug addiction, alcohol addiction, and smoking.

So far, in Australia has been developed and patented the concept of virtual reality hypnosis by Carbis and Mastropalo under the name of Virtual Medicine Pty Ltd, and those interested can participate in different intervention programmes for: weight loss, anxiety / panic / depression management, sleep disorders and smoking cessation.

We intend to use virtual reality hypnosis in a study for smokers who want to quit smoking, and they are willing to involve in this process. The objective is to implement an affordable and an effective intervention program for those who want to quit smoking, using virtual reality and hypnosis. Participants will experience some virtual environments with specific stimuli in order to decrease the level of craving, and in the same time they will receive hypnotic suggestions with which they will reinforce their goal to quit smoking.

As far as we know, until now, no studies using virtual reality hypnosis in smoking cessation have been published, so we are interested in the outcomes of this intervention method.

The technology that we are going to use in this study is the Oculus Rift, which is a headset especially designed for people who are interested in the virtual reality. Oculus Rift has software for the head tracking which replicates the way the user would look around in the real world thus allowing the user to look around the virtual world in the same manner. The user's head movement is continuously analysed and it is not necessary to use a mouse to control the direction of the view.

The main advantages of Oculus Rifts are: the level of immersion comparative with other virtual reality devices, the head tracking, and the ease with which it can be used.

We expect to obtain differences between virtual reality hypnosis group and control group concerning the nicotine consumption and we are hoping that the participants from the virtual reality hypnosis group will have a higher rate of abstinence. These results may represent a starting point for improving such an intervention program and for designing new similar projects for different categories of affections.

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