Virtual Healing: Designing Reality

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Virtual Therapy in Patients with Depression. Preliminary Observation

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INTRODUCTION

Depression disorder with anxiety is considered an important public health problem. The efficacy of cognitive-behavioral therapy (CBT) for depression has been widely demonstrated. Depression is a serious disorder that needs a careful diagnosis. Also the duration of the illness is important, as all people tend to experience bouts of depressed mood that disappear in a few days. Severe depression can last for weeks, months or years. Many therapists tend to combine the cognitive and behavioral techniques into one single package for the patient, customizing it to the needs of the individual. Studies have shown that these strategies can be very effective with a large number of depressed patients.[1,2]

Anxiety disorders are classified according to whether the anxiety is persistent (general anxiety) or episodic, with the episodic conditions classified according to whether the episodes are regularly triggered by the same cue (phobia) or not (panic disorder). The more severe form of panic disorder features agoraphobia - the fear of open spaces, fear of being outside of the house alone or fear of being in crowds. [2,3]

The use of VR as a therapeutic tool, in the psychological field, has made a big impact in the last five years. The desire to improve people’s quality of life has meant, at the same time, an evolution regarding the instruments used compared to the traditional tools in psychology. But Virtual Therapy (VT) has several advantages compared with conventional techniques. [4,5]

VR is having a great acceptance by clinical community given the enormous potential that offers.

The inclusion of the virtual environment does not alter anything of what Korchin considers essential for psychotherapy, that is, the belief in the possibility of change, the faith in the therapist as an expert, the positive expectations towards therapy and the motivation to change, the therapist’s qualities as a person who inspires reliance and safety, communicates respect and desire for helping, who is able, in short, to get the patient’s complete cooperation. [6,7]

The therapist can make the patient to understand that the virtual scenario allows him/her to know the situation that he/she has always considered threatening and with absolute security of being protected since nothing he/she fears can occur. The virtual scenario is, actually, a “safe base” that therapy offers to the patient and from which he/she can freely explore, experience, feel, live, revive feelings and/or thoughts being these either current or past. Finally, another important advantage of VR is that allows the person to go beyond reality. [8,9,10]

Measures: In this open study we compared two types of treatment – virtual reality therapy and cognitive-behavioral therapy – for patients showing a major depression and anxiety. Two groups of patients are formed and compared: a “VT” group and a “CBT” group. For collecting the data concerning this issue we used these scales: HAMD, STAI, CGI, Q-LES-Q. The data were processed using the SPSS statistics software, 11.0 version.

Equipment: The devices used are a PC. The features required are: Pentium IV or equivalent, 256 MB of RAM, CD-ROM drive, a monitor capable of displaying 1024 by 768 in 16 bit color, a Direct3D or OpenGL compatible 3D Graphic Accelerator Card with 32 MB of RAM, a Pointing Device (Mouse, etc.), and a Sound Card. The software required is Microsoft Windows XP, 2000, Microsoft Internet Explorer 5.0 or
higher, and Microsoft DirectX 9.0 or higher for DirectX compatible 3D Graphic Accelerator Cards. As for the visual devices we use a V6 (Virtual Research) HMD (Head Mounted Display) as the patient visual device, and a 17” Monitor as the therapist visual device. The Navigation & Interaction Devices are a mouse (2 Buttons) as the patient navigation & interaction device, and a Keyboard as the therapist interaction device. The Audio Devices are Headphones as the patient audio device, and Headphones as the therapist audio devices. 

We use the computer program that was created by our engineer collaborator. The patients need to choose what they want to see. This includes many small programs, multiple imagines for different theme, and the patients select few small programs and in finally he created an unedited therapeutic plan in VT.

**Objective:** These were aimed at highlighting: 1. Decreased severity of the depression; 2. Interference of depression with academic performance and social life; 3. Identification of a possible VR efficacy.

**Participants:** The survey included 20 patients with depression and anxiety, ages between 25 to 50, all received antidepressive medication. Two groups of patients are formed and compared: a “VT” group and a “CBT” group. For all 20 patients the duration and severity of the depression were estimated by the HAMD’s scale, anxiety estimated by the STAI’s scale, CGI-S’s scale and Q-LES-Q to assess the degree of enjoyment and satisfaction experienced by subjects in various areas of daily functioning.

The allocation of patients to one of these two groups was done according to some constraints (more specifically the ability to use computers and virtual reality software) while ensuring of the homogeneity of the two groups in terms of significant criteria: sex and age of the patient, duration and severity of the depression.

The themes for VT were chosen according to the objectives of the study and were based on the previous research concerning patient’ interests and needs at this severity depression and anxiety.

**METHODS**

The instruments used to establish the diagnosis are the following:

**Screening Interview:** This instrument, developed by our group, screens information about demographic variables, reasons for seeking treatment, duration of the disorder, perceived severity, past treatments, alcohol and substance intake, and presence of physical illness. The instrument also screens the occurrence of possible anxiety disorders.

**Consent Form:** Patients will read and sign an informed consent form about the study before starting the assessment phase.

**Medication control:** During the study, the patient cannot increase the medication dosage. However the patient can start tapering medication when he/she feels better with the guide of a psychiatrist. This is an index of improvement that should be recorded using this instrument. The therapist has a record of the type and dosage of medication throughout all the process.

**Diagnostic Interview:** It is a semi-structured interview that assesses the DSM-IV anxiety disorders and mood disorders and screens for other major disorders. We will use the sections for depression and anxiety.

**Hamilton Rating Scale for Depression:** This is one of the most widely used inventories for evaluating the presence of depressive symptoms. It is a 21-item self-report questionnaire.

**State-Trait Anxiety Inventory:** The Anxiety Trait is defined as a relatively stable anxiety apprehension by which participants differ in their tendency to perceive situations as threatening and to increase, consequently, their state of anxiety. The State Anxiety reflects a “transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity.” State anxiety may fluctuate over time and can vary in intensity. The scale has 20 items, half of them formulated in a positive way and the other half in a negative way. Scores on the STAI have a direct interpretation: high scores.
on their respective scales mean more trait or state anxiety and low scores mean less.

Clinical Global Impression (CGI-S): The therapist answers the question: Considering your clinical experience, how do you evaluate the global severity of this patient?, and evaluates from a clinical point of view the global impression about the patient’s severity in a 1-6 subjective scale.

Q-LES-Q (Quality of Life Enjoyment and Satisfaction Questionnaire): To assess the degree of enjoyment and satisfaction experienced by subjects in various areas of daily functioning. It is a self-administered questionnaire may aid in monitoring quality of life outcomes of mood disorder patients.

The treatment program for Cognitive behavioral therapy include several components: a) Educational; b) Slow breathing training; c) Cognitive Therapy; d) Exposure; e) Relapse prevention. The treatment program includes nine sessions.

Our VR program is called Depression- Anxiety. It has seven Virtual Environments: “the room”, “the subway”, “the sea”, “the mountains”, “the shopping mall”, “the family”, “the colleagues”.

RESULTS

Results show that the virtual therapy group will improve at least as much as the cognitive and behavioral therapy group, and the results for virtual therapy group show up quickly, after 2 months of treatment.

Virtual reality offers the therapist and patient total control over their environment and the ability to proceed at an individualized pace. It is important to remind patients that VR allows them to “feel and experience” what happens when coping with an anxiety situation, but in a completely safe context. Patients should be introduced to the system at the first session with a brief explanation of what they are going to do and what they will encounter. It is very important to help patients get inside the situation. Therapists must be careful to contextualize the environments, adapting them to aspects of daily living with short introductory stories.

The results show that if we compared media of two groups we see that media of depression before and after CBT decreased more like for media of VT. But, the differential is small. We need emphasize that results of VT are received much early, in 2 month.

Regarding the measures related to the level of depression, our data so far showed that VR exposure and in vivo exposure achieved a similar efficacy and both were

![Graph showing before and after therapy media of CBT and VT](image)

**Table 1**: Depression Level: before and after therapy (CBT or VT)

<table>
<thead>
<tr>
<th>Group</th>
<th>Moment of Assessment</th>
<th>N</th>
<th>Media</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression Level</td>
<td>CBT</td>
<td>Initially</td>
<td>10</td>
<td>24,63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Finally</td>
<td>10</td>
<td>12,66</td>
</tr>
<tr>
<td>VT</td>
<td>Initially</td>
<td>10</td>
<td>24,40</td>
<td>0,001</td>
</tr>
<tr>
<td></td>
<td>Finally</td>
<td>10</td>
<td>17,10</td>
<td></td>
</tr>
</tbody>
</table>
significantly more efficacious than the waiting list group in measures directly related to depression and anxiety and impairment.

As for the measures related to effectiveness axis, both treatment conditions seemed equally effective regarding the expectations and satisfaction related to the exposure component, the improvement rated by both the clinician and the patient, and the clinical status evaluated by the clinician.

### Table 2: State Anxiety Level: before and after therapy (CBT or VT)

<table>
<thead>
<tr>
<th>Group</th>
<th>Moment of Assessment</th>
<th>N</th>
<th>Media</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Anxiety Level</td>
<td>Initially</td>
<td>10</td>
<td>50,46</td>
<td>0,001</td>
</tr>
<tr>
<td></td>
<td>Finally</td>
<td>10</td>
<td>32,40</td>
<td></td>
</tr>
<tr>
<td>VT</td>
<td>Initially</td>
<td>10</td>
<td>50,26</td>
<td>0,001</td>
</tr>
<tr>
<td></td>
<td>Finally</td>
<td>10</td>
<td>39,90</td>
<td></td>
</tr>
</tbody>
</table>

### CONCLUSION

Results show that the virtual therapy group will improve at least as much as the cognitive and behavioral therapy group, and the results for virtual therapy group show up quickly, after 2 months of treatment. Benefits in VT: more realistic assessment, reduced therapy cost, increased safety, improve quality of life.

### Table 3: Trait Anxiety Level: before and after therapy (CBT or VT)

<table>
<thead>
<tr>
<th>Group</th>
<th>Moment of Assessment</th>
<th>N</th>
<th>Media</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Anxiety Level</td>
<td>Initially</td>
<td>10</td>
<td>54,96</td>
<td>0,001</td>
</tr>
<tr>
<td></td>
<td>Finally</td>
<td>10</td>
<td>37,60</td>
<td></td>
</tr>
<tr>
<td>VT</td>
<td>Initially</td>
<td>10</td>
<td>54,50</td>
<td>0,001</td>
</tr>
<tr>
<td></td>
<td>Finally</td>
<td>10</td>
<td>44,46</td>
<td></td>
</tr>
</tbody>
</table>
The study was conducted in the Virtual Therapy Unit of the Socla University Hospital, Iasi, Romania. This unit it is the first Centre of Virtual Therapy in Romania.

Virtual Therapy (VT) has several advantages compared with conventional techniques. One of the essential components to treat these disorders is exposure. In VT the therapist can control the feared situations at will and with a high degree of safety for the patient, as it is easier to grade the feared situations. Another advantage is that VT is more confidential because treatment takes place in the therapist’s office. It is also less time consuming as it takes place in the therapist’s office.

We think that VT exposure can be a useful intermediate step for those patients who refuse in vivo exposure because the idea of facing the real anxiety situations is too aversive for them. VT was specifically indicated to allow patients in recovering their planning, executing and controlling skills by implementing sequences of actions and complex behavioural patterns that are requested in everyday life. Also, several story developments can be made available, each of them containing situations designed with different persuasive messages, depending on the user’s responses and stage within the treatment, along several sessions.

REFERENCES