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Promotion of Emotional Wellbeing in Oncology Inpatients Using VR

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Abstract. *Introduction* In Psycho-oncology, VR has been utilized mainly to manage pain and distress associated to medical procedures and chemotherapy, with very few applications aimed at promotion of wellbeing in hospitalized patients. Considering this, it was implemented a psychological intervention that uses VR to induce positive emotions on adult oncology inpatients with the purpose of evaluating its utility to improve emotional wellbeing in this population.

Method Sample was composed of 33 patients (69.7% men, aged from 41 to 85 years old; $X=62.1$; $SD=10.77$). Intervention lasted 4 sessions of 30 minutes, along one week. In these sessions, two virtual environments designed to induce joy or relaxation were used. Symptoms of depression and anxiety (Hospital Anxiety and Depression Scale, HADS) and level of happiness (Fordyce Scale) were assessed before and after the VR intervention. Also, Visual Analogue Scales (VAS) were used to assess emotional state and physical discomfort before and after each session.

Results There were significant improvements in distress and level of happiness after the VR intervention. Also, it was detected an increment in positive emotions and a decrease in negative emotions after sessions.

Conclusions Results emphasize the potential of VR as a positive technology that can be used to promote wellbeing during hospitalization, especially considering the shortness of the intervention and the advanced state of disease of the participants. Despite the encouraging of these results, it is necessary to confirm them in studies with larger samples and control groups.

Keywords: Virtual Reality, Cancer, Hospital Setting, Positive Emotions

Introduction

VR has been utilized in health psychology with very good results. For example, it has been used to manage pain associated to medical procedures (burn care procedures, punctures, dental procedures) [1-3] and for assessment and rehabilitation of patients with strokes or dementia [4-5]. In Psycho-oncology, it has been used mainly to manage

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pain and anxiety associated to medical procedures (especially with children and adolescents) [6-11] as well as to handle distress during chemotherapy [12-16].

Studies that focused on painful medical procedures with children and adolescents indicates that VR helps them to manage anxiety, fear and pain during procedures [6-9], being considered by patients as a positive experience [10].

Moreover, VR has been utilized to handle distress during chemotherapy with very positive results. Studies show that VR alters time perception during chemotherapy sessions, so it became a more tolerable procedure [12-14]. Also, it was detected a significant decrease in anxiety, distress and fatigue immediately after chemotherapy sessions with VR [15, 16].

To our knowledge, there are very few applications focused on the promotion of wellbeing during hospitalization [17-19]. Considering that hospitalization is usually associated to stressing conditions (changes in health status, level of autonomy, intimacy and others) it is important to have therapeutic tools capable of respond to such conditions and needs.

Therefore, this study focuses on the promotion of emotional wellbeing – specifically, induction of positive emotions- through two virtual environments, in a group of patients little considered so far: hospitalized oncology patients. In particular, the objective was to increase positive emotions of joy and relax during their hospitalization period.

1. Method

1.1 Participants

Eligible patients were adult cancer patients with a Karnofsky functional state ≥ 50 , indicators of adequate organ function, life expectancy ≥ 2 months and who were hospitalized for at least 1 week. Patients with serious psychopathology, legal incapacity or brain metastasis were excluded. All participants signed an informed consent before starting his/her participation in this study.

The sample was composed of 33 patients (69.7% men, aged from 41 to 85 years old; $X=62.1$; $SD=10.77$). Most of them had elementary educational level (75.8%). The main causes of hospitalization were acute crisis (33.3%) and specialized treatment (30.3%). The most frequent diagnoses were lung (18.2%) breast (15.2%) and bladder cancer (12.1%). The majority of patients had metastatic cancer (81.8%).

2. Measures

2.1. Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) adapted version (Tejero, Guimerá, Farré & Peri, 1986).

This is a 14-item scale that has two subscales: anxiety and depression symptoms. Each item is scored on a 4-point Likert scale (0-3) [20].

2.2. Fordyce Questionnaire (1972, 1973).

It assesses the intensity of happiness experienced during the last week on a 0-10 scale (very unhappy, very happy) and its frequency [21].

2.3. Visual Analogical Scales (VAS): Mood.

It consisted of 7 items in a scale from 1 (“not at all”) to 7 (“completely”). Five items assessed the intensity of several emotions (joy, sadness, anxiety, relax and vigor), 1 item assessed general mood state, and finally, a question assessed subjective mood change after session.

2.4. Visual Analogical Scales (VAS): Physical Discomfort.

It consisted of 3 items to assess the level of fatigue, pain and physical discomfort, using a 0 (“not at all”) to 10 scale (“completely”).

3. Intervention

Intervention lasted 4 sessions (two oriented to joy and two oriented to relaxation) of 30 minutes, administered along 1 week. To induce these positive emotions two virtual environments (park and forest) [22, 23] were used. Each virtual environment had specific formal characteristics (colors, lighting, music) and activity content depending on the objective to be achieved (induction of joy or relaxation). The activities included were: working with self statements and images, videos, slow breathing, mindfulness and autobiographical memories. Each session took place in the patient’s room. To present each session a TV screen connected to a computer was used, both installed on a trolley that allowed movement from one room to another. Keyboard and mouse were used as interaction devices, and participants used headphones to listen to instructions and music.

4. Procedure

Before starting the program, participants were instructed about how to navigate inside the virtual environments. In the first two sessions, patients could choose the virtual environment they want to visit (Park or Forest). In the following sessions, participants visited the remaining environments. Sessions 1 and 3 were oriented to induction of joy, and sessions 2 and 4 were focused on relax. Symptoms of depression and anxiety (Hospital Anxiety and Depression Scale, HADS) and level of happiness (Fordyce Scale) were assessed before and after the VR intervention. Besides, mood and physical discomfort (VAS) were evaluated before and after each VR session. All procedures took place in the patient’s room.

5. Results

Of the 33 patients, 21 completed the intervention (4 VR sessions). Twelve patients received fewer sessions due to discharge (n=10) and voluntary withdrawal (n=2).

There were significant reductions in anxiety and depression levels (depression scale, $t=2,747$; $p=.012$ and total HADS, $t=2,440$; $p=.024$) and significant increases in happiness levels after intervention (happiness intensity, $t=-2,116$; $p=.047$ and total happiness, $t=-2,055$; $p=.05$).

Also, there were significant improvements in emotional state and physical discomfort after each session. Positive emotions increased and negative emotions decreased after each VR session: In Session 1 (n=33) it was observed an improvement in mood ($t= -2,002$; $p=.05$) and vigor ($t=-2,072$; $p=.046$). In Session 2 (n=29), levels of mood ($t=-3,360$; $p=.002$), joy ($t=-2,010$; $p=.05$), sadness ($t=3,144$; $p=.004$), fatigue ($t=2,183$; $p=.038$) and physical discomfort ($t=2,163$; $p=.039$) improved significantly. In Session 3 (n=22) there was a significant improvement in anxiety ($t=2,171$; $p=.042$) and physical discomfort ($t=2,027$; $p=.056$). Finally, in Session 4 (n=21) there was a significant increment in joy ($t=-2,253$; $p=.036$).

6. Conclusions

These results emphasize the potential of VR as a positive technology that can be used to promote wellbeing during hospitalization, especially considering the shortness of the intervention and the advanced state of disease of the participants.

Given the limited number of VR applications oriented to hospitalized patients and even more, given the scant number of VR applications focused on promotion of wellbeing in this kind of population, this study contribute with important information about feasibility of this type of interventions in hospital setting (showing that it is possible), and also, valuable information about its possible benefits on emotional wellbeing. However, despite these results are promising, it is necessary to corroborate them in studies with larger samples and control groups.

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