Using virtual reality for better healthcare

Department of Clinical Pharmacy Research and Education, Graduate School of Pharmaceutical Sciences
Assistant Professor **Kazuyuki Niki**

Researchmap https://researchmap.jp/kazuyuki_niki

Abstract

With the aging of the population, the increase in the number of cancer patients and dementia patients has become a global problem. In addition, digital transformation (DX) is currently advancing rapidly in various fields due to the influence of the COVID-19, and digital therapeutics are attracting attention in the medical field. Therefore, I try to improve the QOL of cancer patients and develop new methods to prevent dementia by practicing digital therapeutics using virtual reality (VR).

Background & Results

Many terminal stage cancer patients wish to go back to their memorable places, but due to the burden of various symptoms and especially recently due to the COVID-19, it is sometimes impossible to realize their wishes. Therefore, I conducted a clinical trial with the idea that if I could simulate the patients' wishes by using VR, it would lead to an improvement in QOL (Fig. 1). As a result, significant improvements were observed in pain, fatigue, drowsiness, breathlessness, depression, anxiety, and well-being (Fig. 2). On the other hand, no serious adverse reactions such were observed. Furthermore, the patients who went to the memorable places by VR showed significant improvements in many symptoms, but, there was no significant improvement in the patients who went to the places they had never been but wanted to go (Fig. 3).

From these results, I believe that it is important to "bring back memories" and I have started to develop a dementia prevention method using VR. One of the most common non-drug therapies for dementia is the reminiscence. I hypothesized that a VR environment with a sense of immersion and realism would make the reminiscence more effective, so I first focused on the behavioral and psychological symptoms of dementia (BPSD) and piloted the effectiveness and safety of VR-based reminiscence. As a result, I found that the VR-based reminiscence significantly reduced anxiety in late-stage elderly people and that there were no serious adverse reactions.

Significance of the research and Future perspective

I am the first person in the world to report that the use of VR improves various physical and mental symptoms of terminal cancer patients. This report has been widely cited, and I have received consultations about the introduction of VR into medical care not only from Japan but also from overseas, and I feel that it is becoming popular. I also suggest the effectiveness of VR-based reminiscence for BPSD. It is important to note that I discover the possibility that use of VR can lead to the realization of better medical care, and I believe that these findings are of great significance for the present and the future, when DX is accelerating further in the with and post COVID-19 era. From the standpoint of medical professionals, I will continue to examine the possibilities of digital therapeutics using various smart devices, including VR.
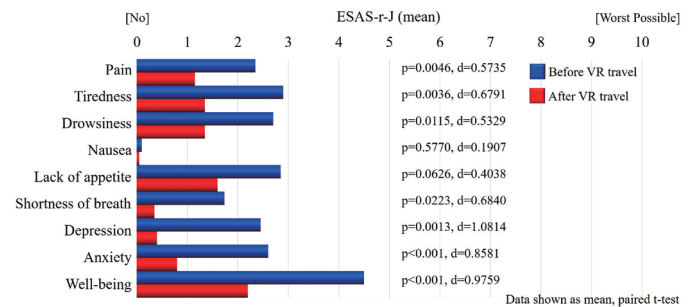

Figure 1. A patient experiencing VR

Figure 2. Changes in physical and mental symptoms before and after the VR travel
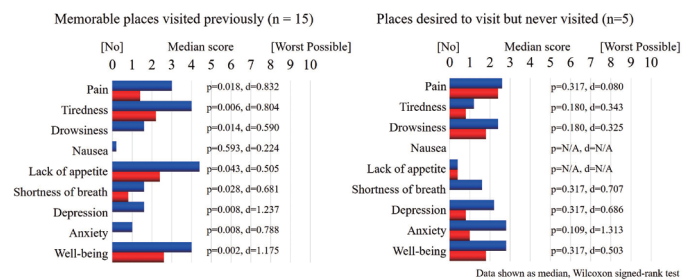

Figure 3. Analysis by VR travel destination