



Virtual Reality in Korsakoff's Syndrome

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Abstract

Purpose - Korsakoff's syndrome (KS) is a severe neuropsychiatric disorder following thiamine deficiency often resulting from chronic alcohol consumption. KS is characterized by cognitive problems, such as impaired memory, decreased organization and planning skills, and confabulations. Patients diagnosed with KS often require long-term care, because of the severity of their cognitive problems and psychiatric problems.

Case description - In this project, virtual reality techniques were administered to a Korsakoff's syndrome population in a long-term (residential) treatment setting. Following an overview of the technique, three vignettes that illustrate how virtual reality techniques can ameliorate the mood, felt sense of control and activity levels of KS patients.

Outcomes - Actively engaging in virtual reality settings encouraged KS patients to decrease their apathy, matched their individual needs, and increased laughing behavior.

Conclusions – Virtual reality techniques can actively engage patients diagnosed with KS in activities that are normally not initiated because of apathy. More systematic research on virtual reality techniques in KS should be conducted to test for possible benefits on quality of life, autonomy and reduction in neuropsychiatric symptoms.

Introduction

Korsakoff's syndrome (KS) is a severe neuropsychiatric disorder that develops as a consequence of vitamin B1 deficiency. KS is characterized by severe memory disorders, problems in planning and executing behavior and confabulations (the use of fabricated memories) (Arts et al., 2017). Since KS is a neuropsychiatric disorder, many patients experience severe neuropsychiatric symptoms, such as apathy, depression, agitation, irritability and disinhibition (Gerridzen et al., 2018). Because of the severity of symptoms, KS patients often require intensive long-term care in specialized facilities (Van Dam et al., 2019).

Recently, the use of music therapy for KS patients gained some interest (Van Bruggen – Ruffi & van Rijn, 2021). In two case vignettes, patients with KS showed improved communication skills, reduced behavioral problems, and a better quality of life as a consequence of music therapy interventions. One main intervention is listening to music that patients liked before onset of KS, reliving the past. In one case report, a KS patient who lost most of his communication skills opened up after listening to Pink Floyd. He started talking and communicating about his past, and laughed instead of being enclosed by severe apathy. Also, Navone (2013) described the effectiveness of listening to music in a depressed KS patient, resulting in less apathy and decreased symptoms of depression. In a second case group study (Van Bruggen & Ruffi & Van Rijn, 2021), a small group of KS patients were offered therapeutic song-writing, and given the opportunity to rewrite the lyrics of a familiar song. After ten sessions of listening to familiar music and talking about this, the five patients made a new song with new lyrics on an old memory. In the process of creating, notating and/or recording lyrics and music by the client and therapist within a therapeutic relationship, the psychological, emotional, cognitive and communication needs of the client were met (Baker & Wigram, 2005; Van Bruggen & Ruffi & van Rijn, 2021).

Most recently, other forms of creative art therapies in KS gained interest. In creative arts therapy, multiple ways to regain information are being explored through music, arts and dance. A case vignette of a patient diagnosed with KS displayed that a patient danced with open arms. The therapist mirrored the movements of the patient. The dance of the patient reminded her of a peacock dress she wore to music festivals prior to the development of KS (Van Bruggen – Ruffi et al., 2022). Another patient, always looked forward to arts therapy. He liked to guess the theme of the day based on pictures of this theme. Also the group process, of meeting new people, helped him cope with KS (Van Bruggen – Ruffi et al., 2022).

Because of the severity of cognitive and psychiatric symptoms, applications of music and arts therapies in KS can be restricted. For example, three patients were invited to the aforementioned group, but eventually did not visit the therapy sessions possibly caused by apathy (Van Bruggen & Ruffi & van Rijn, 2021). Also earlier studies on the application interventions to improve memory in KS resulted in high drop-out rates, with patients actively

stopping the therapy sessions (See Oudman et al., 2015 for an overview). One possible way of overcoming restricted interest and engagement in music and arts therapy is the use of virtual reality techniques. In a recent published study, virtual reality was applied in patients with advanced dementia, with a specifically designed program to meet the nursing home residents needs (Kim, Park, Lim, 2021). Virtual reality programs were designed to meet the psychological need of comfort, identity, inclusion, attachment and occupation. Activities related to the need of comfort included walking, eating a snack, physical contact (hugging), and creating a quiet environment. The need for identity included activities such as religious activities, and visits from family members and guardians. Inclusion was supported through positive supports from others. Attachment included checking objects with name tags. Regarding occupation, patients were reading, solving puzzles, and playing card games. All activities were presented through visual images and videos on virtual reality glasses. During presentation of the virtual reality images, dementia patients had assistance of a therapist, helping to set up the device, starting the presentation and supporting in case virtual reality was overwhelming.

Materials and methods

Materials

As a treatment intervention, virtual reality techniques were examined by movement therapist Joel Kruisselbrink. The purpose of this study was to introduce virtual reality techniques as a safe and new form of creative therapy, actively engaging patients in a virtual reality setting. A virtual reality device, the Limege, was used. On the device, movies of activities that were important for the patient were displayed and the behavior of the patient was followed by the therapist. First, the virtual reality device was introduced for the patient by the therapist. Patients were asked what earlier situations and events were purposeful for the patient.

Residence and patients

This study was carried out in Expertise Center for Korsakoff Syndrome "Slingedael" in Rotterdam. All four included patients were diagnosed with Korsakoff's syndrome after extensive multidisciplinary diagnostics. The patients lived in a residential setting for long-term care, and required 24-hours of care per day. All included patients had severe memory disorders and also showed severe apathy, resulting in an intensive requirement of care. Clients provided consent for participation in this vignettes serie, and also gave consent for making photographs of the situation where virtual reality was applied. The ensuing examples were selected to illustrate the value of using the modified amusement park drawing with an adult SUD population in a residential setting.

Vignettes

The following vignettes were obtained from clients participating in movement therapy. Movement therapy was typically scheduled for 30 minutes per day, with a maximum of three days per week. It was mandatory for all patients to participate. A non-directive clinical approach was employed, in a sense that patients could choose their virtual experience videos on beforehand, and change the video during the intervention. Photographs and short video tapes were made with consent of the patient and families. Responses of the client were written down and analyzed by Ivar Noback and Erik Oudman.

Results

Peter

Peter was a 66-year old, single, white male born in Suisse. He had a high school degree, and was educated as a ski instructor in Austria. After moving to the Netherlands, he worked as a hotel chef the cuisine. He had a long history of alcohol abuse, but alcohol abuse increased after his girlfriend died at a young age 5 years prior to admission in the Korsakoff Center. Peter was 56-years old when he complained to his general physician of memory problems. Later that year he was admitted to the hospital after not being able to open his front door. In the hospital a Wernicke Encephalopathy was diagnosed, based on malnutrition and alcohol abuse. Although Wernicke Encephalopathy was treated with high doses of thiamine, Peter developed severe Korsakoff syndrome, possibly related to a relatively long period of malnutrition and late administration of thiamine. After being admitted to the long-term care facility he often lived a quite withdrawn existence within the facility. He did not like crowded places and often made puzzles on his own apartment. Because of the increased apathy and relatively sad mood, virtual reality techniques were indicated by the psychologist (Ivar Noback) and the movement therapist (Joel Kruisselbrink). After chatting about the possibilities of virtual reality, Peter told both therapists that he liked skiing, as he was a ski-instructor in Austria. The movement therapist uploaded a movie of skiing on the virtual reality device, and Peter was instructed to move as a skier in his apartment. Following the start of the virtual reality experience, Peter was laughing while he was moving on his imaginary skies. He mentioned aspects of the experience to the both therapists, namely the length of the skiing circuit and the relatively low number of other people on the skiing circuit. While he was moving on his skies, he was instantly laughing all the time and moved as a skier. After stopping the virtual reality experience, Peter reported to both the therapist that he really liked skiing and asked them to come back with the virtual reality device. In the month following his first virtual reality experience, Peter went skiing with the movement therapist in an indoor ski hall. Because his skills regarding skiing were relatively unfamiliar to the nursing and treatment staff, actual skiing was not initiated in the first 8 years of being admitted to the facility. Peter told the therapists that the virtual reality technique led to confidence that he would be able to ski on his own.



Figure 1 – On this photograph Peter has his Virtual Reality glasses on, displaying a skiing situation.

John

John was a 63 year old technician. He started working at a relatively young age in electrical engineering. He lost his driving license at the age of 40, after drinking and driving. In the same year he lost his job, and was often at home feeling depressed and lonely. At the time, he was drinking 24 glasses of beer per day. After being admitted to addiction care, he was diagnosed with a depression, personality disorder, and a generalized anxiety disorder. He did not show up at any of the treatment sessions, and fell back into his drinking habit. At the age of 56 years, he developed Korsakoff's syndrome, and was admitted to the long-term care facility. Because of the complexity of problems, with combined psychiatric and cognitive problems, he had a relatively minimal day schedule only requiring him to join breakfast, lunch and dinner. In between meals, he would usually hang out in the facility and play chess with another patient, or complain about the facility to care staff. On the ward there was little interaction between John and fellow residents, and John mainly walked around the corridor and is looking for smoking materials. After his cognition further declined, virtual reality techniques were initiated. John was an avid canoeist prior to the development of severe alcoholism. A canoe experience was initiated on the virtual reality device. John sat quietly on a chair in his room while watching the fragment and said he enjoyed it, particularly enjoyed canoeing himself. The staff indicated that John seemed relaxed and responded positively to questions about his experience, recognized some environments from the past, and knew a lot about this.

Joyce

Joyce was a 73 year old lady born in Aruba. She worked as a kindergarten teacher in the Netherlands, after she moved there as a child. After a severe cold, she developed meningitis when she was in her forties, and stopped working. Five years later, she developed a severe drinking habit resulting in cirrhosis and Korsakoff's syndrome. At the age of 63 she was admitted to the long-term care facility, after being in and out of addiction services the 5 years prior to admission. In the clinic she displayed apathic behavior and usually resided in the living facility drinking coffee. As her global medical status deteriorated following a diagnosis of lung cancer palliative care was initiated. Her last wish was that she wanted to go to Aruba. With this information, an intervention was devised using VR glasses. The movement therapist and psychologist started the intervention which consisted of video images of Aruba that could be seen in VR. Joyce responded very positively to this. Visibly has goosebumps on her arms and named characteristic landmarks several times. This recognition created beautiful stories that she would repeat during the days following VR.

Implications and conclusions

The vignettes presented in this paper indicated that clients may respond very positively following Virtual Reality Techniques displaying situations and events that are of personal relevance to the Korsakoff's syndrome patient. Both the implementation and clinical indication for virtual reality techniques were straightforward, leading to a rapid increase in observed quality of life of the patients. The request for action resulted in multiple moods and actions despite the severity of apathy following Korsakoff's syndrome (Oey et al., 2021). Results were therefore remarkable and highlight the positive effects of the use of virtual reality technology in clinical long-term care practice for Korsakoff's syndrome patients.

One of the striking advantages of virtual reality above other techniques was the relative ease to adapt displayed situations to the wishes of the patients. Since patients often showed a clear wish regarding the information they wanted to see on the VR glasses, this gave the therapist relevant information to quickly initiate the intervention.

In the present project both psychologists and movement therapists worked together to implement virtual reality techniques into clinical practice. Movement therapists were of particular importance, because they were trained to activate patients with complex diagnosis, resulting in better activation of the patients during the treatment protocol.

Data availability

No data was used for the research described in this article.

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