Research on the treatment of the elderly with Alzheimer disease in virtual reality puzzle games

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Abstract: Objective: To analyze the impact of educational games on the rehabilitation of older people with Alzheimer's disease. Methods: According to the simple neuropsychiatric inventory (NPI), 60 older people with Alzheimer's disease who received treatment in this study from April 2020 to May 2021 were selected as the research subjects [1]. The most presented data was recorded. The paired sample analysis method divided them into a control group (30 people) and an experimental group (30 people). The control group was given conventional medication only, and the experimental group was given puzzle game therapy. After the experiment, the mental state and cognitive function of the two groups of older people were compared. Results: 1) The experimental group changed significantly on the NPI questionnaire. 2) The indicators of the experimental group are better than those of the control group. The condition of the control group tends to worsen, and the experimental group's condition tends to get better. Conclusion: Virtual reality puzzle games can improve the mental state and cognitive function of patients with Alzheimer's disease to a certain extent and positively affect the rehabilitation of the elderly with Alzheimer's disease [2].

Keywords: Virtual reality puzzle games, Alzheimer disease, Treatment research

1. Introduction

WHO pointed out that there were 47.5 million Alzheimer's disease patients worldwide in 2016. As the number of patients with dementia in low- and middle-income countries continues to increase, it is estimated that the total number of patients with Alzheimer's disease will reach 75.6 million in 2030 and 135.5 million in 2050 [3]. Alzheimer's disease (AD) is a progressive neurodegenerative disease. The onset is hidden. Clinically, it is characterized by general dementia such as memory impairment, aphasia, apraxia, cognition, visual and spatial skills impairment, executive dysfunction, and personality and behavior changes. The etiology is not known yet [2]. Those who develop the disease before 65 years of age are called Alzheimer's disease; those who develop the disease after 65 years of age are called Alzheimer's disease. If you have Alzheimer's disease, if it is not treated in time, it will seriously image the life of the elderly, even life-threatening. This study selected the clinical data of 60 older people with Alzheimer's disease who were treated from April 2020 to May 2021. The report is as follows:

2. Materials and Methods

2.1. General Description

According to the paired sample analysis method, the clinical data of 60 older people with Alzheimer's disease admitted from April 2020 to May 2021 were selected and divided into two groups. The control group included 30 men, 14 men, and 16 women, aged 55-86 years old, with an average age of (70.53±5.36), the duration of illness was 4 months to 6 years, and the experimental group was 30, including 17 males and 13 females, aged 56-87 years old, with an average age of (71.51±4.78). The duration of illness was 6 months to 5 years. By comparing the information of the two groups, the difference was not statistically significant [4].

2.2. Research methods

This study uses the method of paired sample analysis and case-control comparative study to compare the similarities and differences of the effects of drug treatment measures and virtual reality puzzle games on the rehabilitation of patients with dementia. The experimental group was given rehabilitation therapy for virtual reality puzzle games. The main measures are 1. Use the dramas that the elderly like to attract their attention, such as "Peking Opera," "Huangmei Opera," "Yue Opera," and so on. 2. According to the principle of ease of use and fun, the brain training game selects familiar elements generally recognized by the elderly, including rock, paper, scissors: through the gestures and requirements given by the game, select the corresponding options, exercise logical ability, and reaction ability; 3. Shopping payment: combined with daily life, by memorizing shopping lists, simulating shopping, and checking out exercise computing power and memory; 4. Clues to find the picture: look for the corresponding pattern according to the card clues within the specified time;5. Various brain training games improve memory, vision, calculation and logic skills, exercise observation, concentration, and reaction skills [5].

2.3. Evaluation criteria

Mainly use Alzheimer's disease-related rating scale and the author's interview with the nursing staff who participated in the group. The combined use of these scales has high reliability and validity. While the group is in progress, the author will also interview the caregiver to understand the changes after the group members participate and adjust and improve the group according to the situation.

The primary measurement tool is the medical scales related to the rehabilitation of Alzheimer's disease. After long-term clinical trials and applications, these scales have high reliability and validity and can be a good measure of patients before and after treatment. The changes that have occurred. In the course of treatment, group workers will also use observation and interviews (patients themselves, caregivers, and other older people) to track changes in patients [6-7].

Neuropsychiatric Inventory (Npl) includes delusions, hallucinations, aggression, dysthymia, anxiety, elevated mood, euphoria, apathy, indifference, and abnormal motor behaviors. It has 12 entries in total [7]. Nursing staff scored all aspects of bizarre behavior based on frequency (level 5) and severity (level 5). The total score is the sum of the scores of the 12 items. While NPI scores>0, and if there is an item with an NPI score >5, it is defined as a significant symptom.

3. Results

3.1. Control group/experimental group paired sample grouping descriptive statistics

Table 1 Control group/experimental group paired sample grouping descriptive statistics.

		Mean	N(Number of samples)	Std(Standard deviation)
NPI Pre-test	Control group	9.75	30	9.04
	Study group	16.60	30	21.76
NPI Post-test	Control group	28.76	30	23.65
	Study group	5.67	30	11

3.2. T-test results of matched samples in the control group and the experimental group

Table 2 T-test results of matched samples in the control group and the experimental group (p=0.05).

		Difference (Standard deviation)	Paired (Mean difference)	T	Sig(2-tailed)
NPI Pre test -Post test	Control group	18.22	-18	-2.253	0.017
	Study group	16.61	11.88	2.96	0.009

3.3. Comparison of the two groups before and after

3.3.1. Changes in scale scores before and after the control group

In terms of NPI score, before and after the group work intervention, the mean value increased by

18.00, which was a relatively large increase. The T-test results showed a significant difference in the NPI score before and after the group work intervention, and the study subjects had higher neuropsychiatric symptoms [8]. There was even a worsening trend before. In general, the control group's cognitive function was before and after the experimental group's intervention in virtual reality puzzle games. Behavioral and neuropsychiatric symptoms have not changed or become worse, and the patient's condition gradually worsens. Analyze the reasons. The main reason should be the natural deterioration of the patient's condition or other reasons such as external environmental stimulation, the patient's body lesions, and the degeneration of somebody organs [9].

3.3.2. Changes in scale scores before and after the experimental group

Before and after the group work intervention, the mean value reduced by 11.88, a comparatively significant drop [10]. The T-test results showed that the NPI scores of the experimental group were substantially different before and after the group work intervention. The neuropsychiatric symptoms of the study subjects were quite different. It shows that the work of the tabletop game team has a positive impact on the rehabilitation of neuropsychiatric symptoms in patients with Alzheimer's disease [11].

4. Conclusions

As we all know, with the intensification of global aging, the prevention and treatment of Alzheimer's disease have become a topic to be studied and resolved [12]. It has attracted widespread attention from the neuropsychiatric community and even social workers and has become a social public health problem that cannot be ignored. Through a paired comparative study of 60 older people with Alzheimer's disease, and based on the analysis of the results before and after the intervention of virtual reality puzzle games, we can draw the following conclusions: Virtual reality puzzle games have a positive effect on the condition of patients with Alzheimer's disease. The effect is conducive to the recovery of patients; patients who are only given medications have a tendency to get worse, which is consistent with the progressive course of Alzheimer's disease, indicating that Alzheimer's disease cannot be left to anything [13]. A variety of methods are needed to prevent and alleviate Alzheimer's disease.

In summary, virtual reality puzzle games positively affect the rehabilitation of Alzheimer's disease, can effectively alleviate the symptoms of Alzheimer's disease, and have sound clinical value.

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