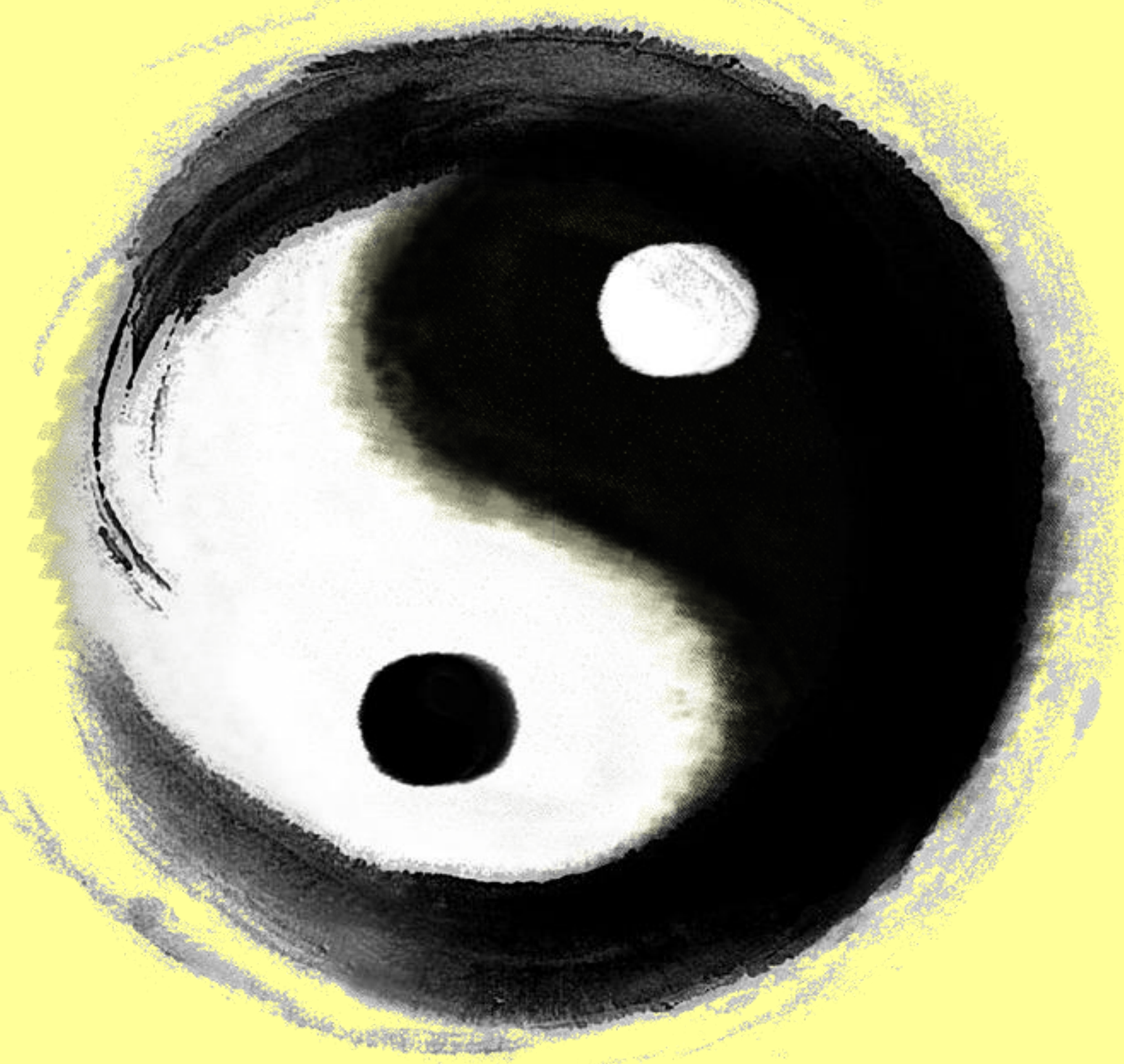


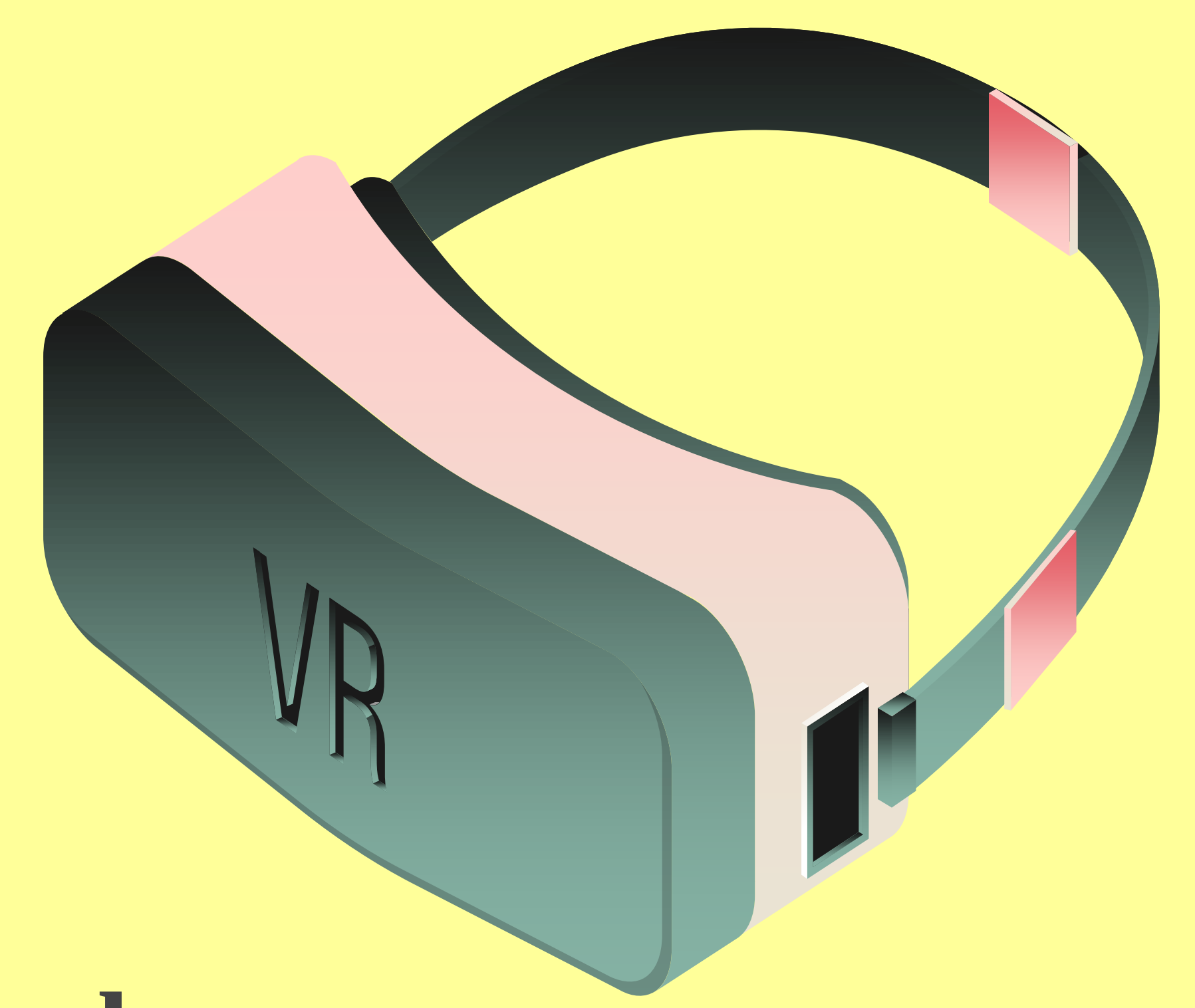


Explored the effect of Tai Chi exercises in VR with high risk of falls in psychiatric patients

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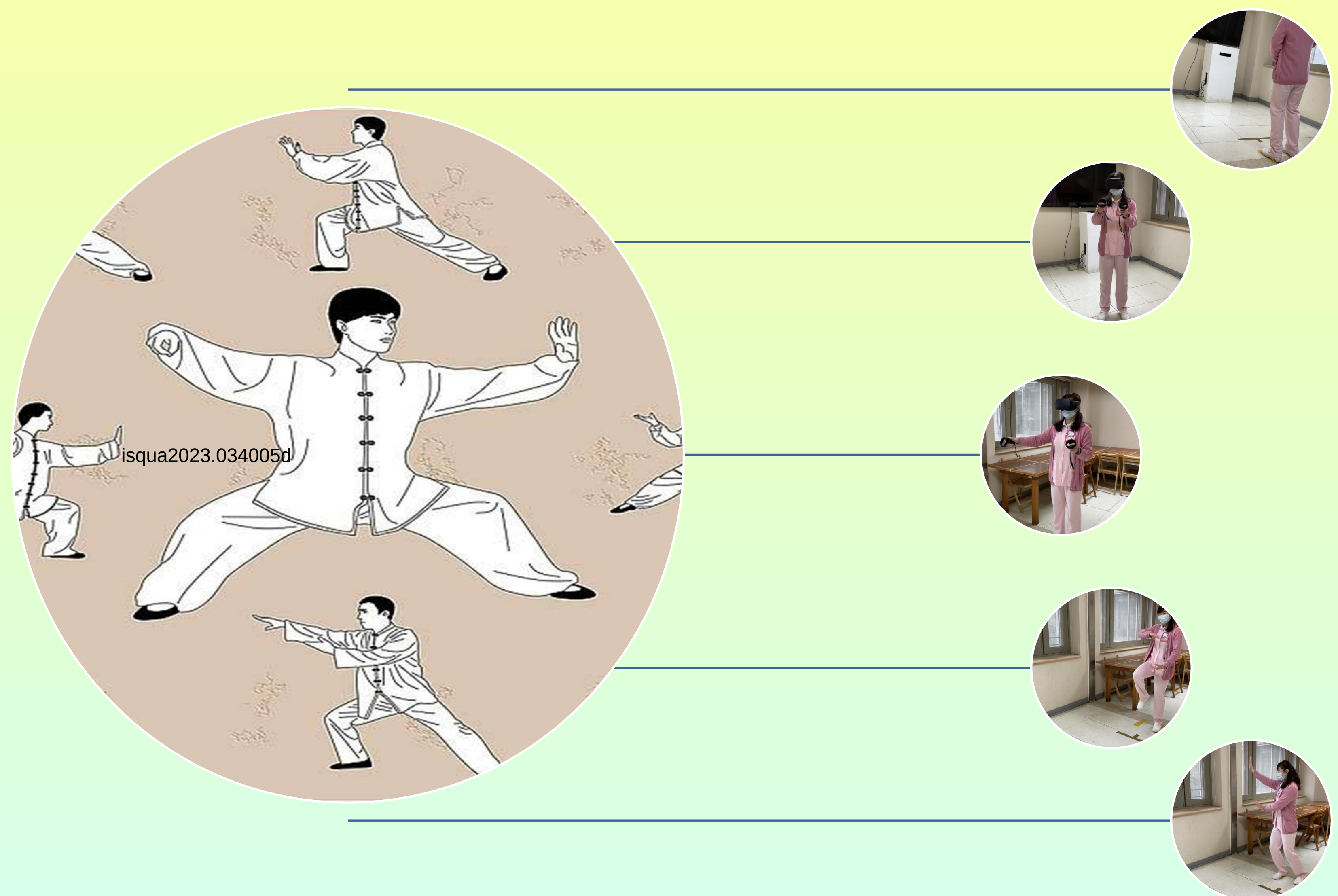


Background: Falls are a common problem for the safety of psychiatric patients. This unit is a day care for psychiatric patients, with a total of 60 beds. After being admitted to the hospital for fall risk nursing assessment, 90% of patients are assessed as high risk of falling, and among them, 70% of patients have lower extremity muscle strength assessments ranging from 4 points (except for gravity resistance and partial resistance resistance) to 5 points (normal), and subjectively complain of weakness, indicating a potential risk of falls. Evidence-based data has shown that performing Tai Chi exercises can improve lower limb muscle strength. The purpose of this study is to explore whether psychiatric patients who perform Tai Chi exercises in virtual reality (VR) can improve lower limb muscle strength and indirectly reduce the incidence of falls.

Methods: This research design adopted an observational study. The subjects of the study were psychiatric day care unit patients who were assessed as high risk of falls and were willing to participate in the study. The study period was from September 2021 to June 2022. Data analysis was performed using IBM SPSS software version 27 for descriptive statistics and paired-sample t-test statistical analysis. The intervention measures involved building the eight-style Tai Chi exercises in VR in January 2021, including:

1. Inverted curling of the humerus.
2. Left and right hug knees and bend steps.
3. The left and right wild horses have separate manes.
4. Cloud hands.
5. The left and right golden rooster are independent.
6. Kick your feet right and left.
7. Right and left hold the tail of the sparrow.
8. Cross hands.

A computer-generated three-dimensional virtual world provided patients with the sensation of being there. When patients practiced Tai Chi exercises in VR and moved their position based on the virtual image, the computer immediately performed complex calculations and sent back an accurate three-dimensional world image to generate a sense of presence, allowing patients to correct their movements in real-time to improve their accuracy.



Results:

1. A total of 23 high-risk falling patients used Tai Chi exercises VR twice a week and practiced for 20 minutes once a week. The evaluation was carried out after 2 months. The number of patients complaining of weakness decreased to 53%, which was a statistically significant difference ($p < 0.05$).
2. Another 12 high-risk falling patients used Tai Chi exercises VR 3 times a week and practiced for 20 minutes once a week. After 4 months of evaluation, the results showed that the lower limb muscle strength of patients assessed as 5 points with a subjective complaint of weakness decreased to 38%, which was a statistically significant difference ($p < 0.05$).
3. These 35 patients have not experienced falls due to lower limb weakness so far, and the incidental result is that the average subjective satisfaction score for Tai Chi exercises VR is 92 points (out of 100).

Conclusion: For psychiatric patients or elderly people who take antipsychotic, antidepressant, sedative, and hypnotic drugs, practicing Tai Chi exercises VR at a fixed frequency can continuously improve the muscle strength of lower limbs, increase health awareness of fall prevention, and promote daily activity satisfaction. The results of this study suggest that operational nursing guidance content can be built into digital (such as AR or VR) teaching materials, which can improve patients' motivation for practice, learning effect, and self-mastery.