

Cognitive Rehabilitation for Vocational Training of Primarily Ketamine Users: A Randomized Control Trial (BDF120021)

Executive Summary

Background & Objectives

Local statistics of drug use showed that ketamine was the top one psychotropic drug taken by secondary students. Apart from the physical and psychological effects, cognitive problems have also been documented. They include impairment in working and episodic memory process in encoding as well as executive function. Cognitive impairment in people with drug abuse may be a barrier in work rehabilitation. There is a paucity of research on direct relationship between ketamine-abuse cognitive problems and vocational outcomes. In the present study, reducing the effect of this cognitive impairment was hypothesized to improve work rehabilitation outcomes and ultimately employability among ketamine users.

In rehabilitation and treatment of drug abusers, conventional community-based vocational rehabilitation (i.e. vocational assessment, counselling, training and supported employment services to drug abusers) has been practiced. In tackling the specific cognitive problems associated with ketamine abuse, cognitive rehabilitation (CR) is proposed as an adjunct therapy to successful vocational outcomes in this population group. To date, virtual reality, a cutting-edge technology, has been widely used neuro-cognitive rehabilitation and in psychiatric conditions. Virtual reality has the advantage of providing a virtual work environment with the potential for infinite repetitions of the same work skills training tasks. The nature and pattern of feedback can be easily modified according to patients' impairments, before they enter a more demanding and complicated real work environment. The present study thus used virtual reality (VR) as an intervention tool for cognitive training and enhancing vocational outcomes.

Methods

This study was a single-blinded, randomized controlled trial (RCT). The participants were recruited from major organization providing drug treatment and rehabilitation services, as indicated in the website of Narcotics Division, Security Bureau of HKSAR. All of these participants were randomly assigned to the two treatment groups (virtual reality group/VGR and tutor-administered group /TAG) using a computational random number generator. Age-, gender-

and education-matched wait-listing control group (CG) were also recruited. The outcome assessments were conducted during pre-test, post-test, and 3-month and 6-month follow up.

Two training programmes (one was a VR-based and the other training a manual-based, both were of similar content but different in delivery modes) using a boutique scenario as the training background was adopted so as to allow total control and consistency in stimulus delivery with the presentation of hierarchical and repetitive stimulus challenges that could be varied from simple to complex. Immediate feedback on performance is also given, which helps to create self-awareness. A total of 10 training modules were divided into three levels: pre-trainee level, trainee level and sales level. The participants had to complete elementary training tasks (pre-trainee and trainee levels) under the supervision of a manager (computerized e-tutor in the case of VR training).

Results

30 subjects of each group were successfully recruited in the beginning of the experiment and evaluated using the key cognitive outcome measures of Digit Vigilance Test (DVT), Rivermead Behavioral Memory Test (RBMT), Wisconsin Card Sorting Test (WCST), work-site test and self-efficacy during pre-, post- test and 3-month, 6-month follow up. The time taken, procedural administration and the feedback from subjects were found to be suitable and 5-10 minutes' break was allowed between different assessments.

Subjects in the three different groups did not differ in their baseline demographic characteristics. VRG had significant improvement in attention. Memory also improved and maintained at 3-month follow up. Significant changes in executive function over time were found in different groups. Results of onsite tests and work self-efficacy were significant improved in both VRG and TAG. Better open employment rate was found in VRG than TAG and CG over a 6-month follow up.

Conclusion

VR-based cognitive training might address the cognitive and vocational problems in ketamine users. TAG has also benefits including the improvement of selective cognitive function and work self-efficacy. The working context of the training environment can be perceived as being highly relevant to the users' perspective compared to component-based cognitive training.