Abstract

Title: Effect of Yoga on Psycho-Motor and Cognitive function among Substance abuser: Randomized Active Control Study

Background

Substance use disorder is a pattern of recurrent use of illicit substances that lead to severe motor, cognitive and psychosocial imbalance. The rehabilitation programs should augment the psycho-motor and cognitive functions to reduce the risks of relapse. Recent studies highlight yoga-based intervention as a promising add-on therapy for the management and preventing addictive behaviors.

Aim

The study aimed to evaluate the efficacy of a yoga-based intervention as an add-on in enhancing psycho-motor and cognitive functions, compared with physical exercise to newly admitted substance abusers seeking an inpatient treatment program.

Materials and Methods

The study was a single, randomized, comparative design that included 96 male participants, between 18 and 40 years in a residential rehabilitation treatment unit. Partakers in the yoga or physical exercise group received supervised daily training for 12 weeks, in addition to standard rehabilitation treatment. Raters blind to the study assessed the patients on the Finger Tapping Task, O'Connor Tweezer Dexterity Test, Automatic Mirror Tracer, Digit span task, Cancellation test, Stroop tests, Self-control, Anxiety, Depression, Sleep and Mindfulness at the baseline and following 12 weeks of

intervention. Group difference was calculated by chi-square test, the Mann-Whitney test or Student t test. While paired sample t-test was used to determine with-in group change.

Results

A significant enhancement in digit forward (yoga – $p < 0.0005$, d = 0.81; exercise – $p < 0.0005$, d = 0.73), digit backward (yoga – $p < 0.0005$, d = 0.88; exercise – $p < 0.0005$, d = 0.58), and letter cancellation test scores (yoga – $p < 0.0005$, d = 1.31; exercise – $p < 0.0005$, d = 1.4) were observed in both the yoga and the exercise groups. Stroop word and color task scores were seen significantly higher following yoga ($p < 0.005$, d = 0.74; $p < 0.005$, d = 1.13) and exercise ($p < 0.0005$, d = 0.62; $p < 0.0005$, d = 0.61). Furthermore, Stroop color-word test showed significant enhancement after yoga ($p < 0.0005$, d = 1.10) and exercise ($p < 0.0005$, d = 0.42), with degree of variation higher in the yoga group. In motor function there is significant enhancement in tapping speeds was observed in both the yoga and the exercise group at 0-10 seconds (TSI) and 10-20 seconds (TS2), but not statistically significant at 20-30 seconds (TS3). The results from the tweezer dexterity were significantly better following yoga ($p< 0.001$, d = 0.99) and exercise ($p< 0.001$, d = 0.82). Furthermore, a significant reduction was seen in Mirror tracing time after yoga ($p< 0.034$, d = 0.39) and exercise ($p< 0.006$, d = 0.53), with differences high in the exercise group. Statistically significant median decrease in mirror error score observed in yoga, z = -1.991, p = .046, but not in physical exercise z = -1.590, p = .112. In psychological variable there was significant enhancement in self-control was observed in both the yoga ($p < 0.033$, d=0.33) and the exercise group ($p < 0.038$, d=0.32). Post yoga intervention shown statistically significant differences in

mindfulness in yoga ($p < 0.017$, d=0.37), whereas in the exercise group, did not find significant differences in mindfulness ($p< 0.169$, d=0.21). The results from the depression and anxiety were significantly less post compared with their respective pre-scores following yoga ($p <0.044$, d=0.31; $p <0.025$, d=0.35) and exercise ($p < 0.032$, d=0.34. $p < 0.039$, d=0.32.). Furthermore, significant reduction was seen in sleep disturbance after yoga ($p < 0.001$, d=0.52) and exercise ($p < 0.001$, d=0.78).

Conclusion

Our results suggest that the add-on yoga or exercise-based intervention show enhancement of cognitive functions. Further, findings provide the utility of yoga and exercise-based intervention in improving motor functions among substance abusers. Furthermore, our results suggest that the add-on yoga and physical exercise shown effective in psychological well beings among substance abusers. Comprehensive trials are needed to understand the potential long-term effects on rehabilitation and relapse prevention.

Keywords: Yoga, Physical Exercise, Substance Use, Addiction, Psycho-Motor, Cognitive function