Effect of Virtual Reality Training on Balance in Middle Aged Adults with Osteoarthritis of Knee: A Pilot Study

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ABSTRACT

Background: Knee Osteoarthritis is one of the most prevalent musculoskeletal conditions in India, with prevalence being 22% to 39%. Balance deficits were found, specifically dynamic more affected than quiet standing balance. Technological advancements and cost decrease in VR hardware & software has allowed expansion of VR application to therapeutic settings for tackling balance issues. Use of VR environment for virtual augmented exercise has recently been proposed as having potential to increase exercise behaviour. VR Headsets are easy to use clinically, portable and cost effective.

Objective: To compare effects on balance of Conventional Balance Training and Virtual Reality Balance Training using Timed Up & Go Test, Functional Reach Test, Star Excursion Balance Test and to record Patient's Self Perception of Improvement using Patients' Global Impression of Change Scale

Method: Study involved 20 Middle Aged Adults (35-55 years), both males and females. Participants were divided into two groups (10 in each). Conventional group received patient specific treatment with Conventional Balance Training and VR group received patient specific treatment along with Virtual Reality Balance Training, both for 5 sessions/week for 2 weeks. Pre and Post balance assessment was done using TUG, FRT, SEBT. PGIC Scale was recorded at the end of study for each individual.

Outcome Measures used were TUG, FRT, SEBT, PGIC Scale.

Results: Differential improvement was seen in VR group as compared to Conventional in the TUG, FRT, SEBT parameters. However, difference was not statistically significant ($p > 0.05$). PGIC Scale response was better in VR Group as compared to Conventional and was statistically significant ($p < 0.05$)

Conclusion: From this study, we concluded that both groups showed improvement, however pre-post difference in outcome measures was substantially better in VR Group as compared to Conventional, however, statistically insignificant. Also, patients reported better change in their condition in VR as compared to Conventional Group through PGIC Scale.

Keywords: Virtual Reality, OA Knee, TUG, FRT, SEBT, Balance Training