Virtual Reality Mindfulness Meditation to Improve Patient-Reported Outcomes Following Anterior Cruciate Ligament Reconstruction: A Case Report

Context: The purpose of this study is to examine the efficacy of virtual reality mindfulness meditation (VRMM) to modify patient-reported outcomes (PROs) in a patient with a history of anterior cruciate ligament reconstruction (ACLR) by assessing clinically significant changes in PROs between pre- and post-VRMMs.

Methods: A 22-year-old female (177.8 cm; 72.575 kg; time since surgery = 10.8 months) with a history of ACLR completed an 8-week VRMM intervention 3 times per week for 24 sessions total. The participant completed the Tampa Scale for Kinesiophobia (TSK-11), the Anterior Cruciate Ligament-Return to Sport after Injury (ACL-RSI), the Fear-Avoidance Beliefs Questionnaire (FABQ), the Knee Injury and Osteoarthritis Outcome Score for Symptoms (KOOS-S) and Pain (KOOS-P) pre- and post-intervention to assess pain-related fear of movement/(re)injury, psychological readiness to return to sport, fear-avoidance beliefs, and knee-related symptoms and pain, respectively. Pre- and post-VRMM change scores were calculated to assess clinically significant improvements in PROs.

Results: Based on Minimal Detectable Change (MDC) values or Minimal Clinically Important Differences (MCID) values for each questionnaire, the patient reported clinically significant improvements for all PROs (TSK-11 change score = 5; MCID = 4.8), (ACL-RSI change score = 24; MDC = 12.85), (FABQ change score = 11; MDC = 7.95), (KOOS-S change score = 21.43; MDC = 5-8.5), (KOOS-P change score = 16.67; MDC = 6-6.1) (Table 1).

Conclusion: This case report demonstrates that VRMM may effectively mitigate poor patient outcomes post-ACLR. These findings underscore the potential of VRMM as a valuable adjunct therapy in the rehabilitation process post-ACLR.

PRO	Pre-VRMM	Post-VRMM	Difference (Pre-Post)	MDC	MCID
TSK-11	25	20	5	-	4.8
ACLRSI	31	55	-24	12.85	-
FABQ	15	4	11	7.95	-
KOOS-S (symptoms)	53.57	75	-21.43	5 - 8.5	-
KOOS-P (pain)	75	91.67	-16.67	6-6.1	-

Table 1. Pre- and Post-8-week VRMM PRO change scores were calculated and compared to MDC or MDIC values.