

# Workload as a Risk Factor and Predictor of Outcomes After Achilles Tendon Rupture in NBA Athletes: A 25-Year Retrospective Analysis

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INTRODUCTION: Achilles tendon rupture (ATR) is increasingly reported in professional basketball players and is associated with reduced performance after return to play (RTP). While prior studies have described RTP rates, the influence of pre-injury workload on both rupture risk and post-injury outcomes in NBA athletes remains unclear. This study evaluated whether elevated workload contributes to ATR risk and whether workload metrics are associated with efficiency decline following RTP.

METHODS: NBA players with confirmed ATR between 2000 and 2025 were identified from publicly available records. Workload metrics, including minutes per game (MP), usage rate (USG%), and player efficiency rating (PER), were averaged over the two seasons prior to rupture and the two seasons following RTP. Pre-injury workload was compared with historical league averages. Correlation and regression analyses assessed associations between workload and post-injury efficiency loss. Subgroup analyses examined age  $\geq 30$  years and RTP timing ( $<12$  vs  $\geq 12$  months). All subjects were male, as the NBA is currently composed exclusively of male athletes.

RESULTS: Forty-three players met criteria for pre-injury workload analysis, and 27 qualified for post-injury performance evaluation. Players sustaining ATR had significantly higher pre-injury MP (25.7 vs 20.1,  $p=0.0057$ ) and USG% (21.1% vs 18.0%,  $p=0.0253$ ) compared with league averages. After RTP, PER declined by 2.6 ( $p=0.0012$ ), MP decreased by 5.67 minutes ( $p<0.001$ ), while USG% remained stable. Higher pre-injury USG% was associated with greater decline in PER ( $r=-0.47$ ,  $p=0.0165$ ), whereas MP was not. Players who increased USG% post-injury demonstrated improved outcomes ( $r=0.44$ ,  $p=0.0278$ ). RTP in under 12 months was linked to larger reductions in MP (-6.13 minutes,  $p=0.0157$ ) and a trend toward greater efficiency loss. Older athletes showed greater decreases in PER and MP, though differences were not statistically significant.

DISCUSSION: NBA players sustaining ATR had elevated offensive workload before injury and demonstrated reduced efficiency and playing time following RTP. Offensive workload, rather than minutes alone, was linked to performance decline. These findings support the hypothesis that Achilles rupture may represent a cumulative overuse injury.

SIGNIFICANCE/CLINICAL RELEVANCE: ATR in NBA players may represent a cumulative overuse injury. Monitoring workload, particularly offensive usage, may reduce rupture risk and inform individualized recovery strategies.

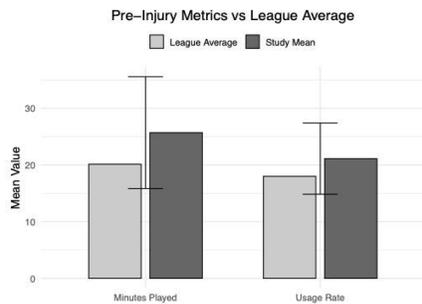


Figure 1: Pre-Injury Workload Compared to League Averages.

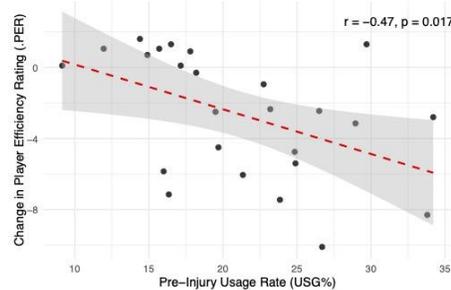


Figure 2: Correlation Between Pre-Injury Workload and Change in Player Efficiency Rating ( $\Delta$ PER).

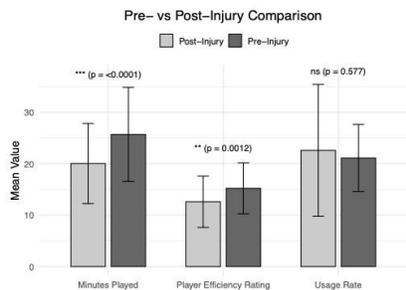


Figure 3: Pre- vs. Post-Injury Performance Metrics.