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Training on sand or on parquet: Impact of a pre-season training on speed and jump performance in professional basketball players

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INTRODUCTION:

The abilities to effectively decelerate, change direction (CoD), accelerate, and jump are crucial physical qualities in modern basketball [1]. Recently, sand as a training surface has received wide recognition in practice for improving these attributes, although scientific evidence is lacking. In particular, the effects of a specific CoD speed training on sand have not been studied so far. Therefore, the present study aims to investigate the effect of CoD speed training on sand compared to a parquet surface with regard to speed and jump performance. **METHODS:**

Twenty-five male professional basketball players (age: 24.1 ± 4.2 years; height: 192.5 ± 8.0 cm; body mass: 92.6 ± 11.6 kg), from three teams with an equal level of competition, participated in a systematic controlled pre-season intervention study over seven weeks, followed by a taper week. Two teams completed an identical speed training protocol either on sand (S) or on a hard surface (H), while the third team served as control (C), with all following their pre-season training at the same total training volume. The training protocol was applied twice a week, consisted of CoD drills in combination with plyometrics and followed a weekly progression regarding training volume and intensity. Pre-intervention and post-tapering, subjects were tested for speed (5, 10, 20 m sprint (ST)) and jumping performance (countermovement jump (CMJ), pivot jump (PJ), repeated jumps (RJ), crossover triple hop (CH)).

RESULTS:

A repeated-measures ANOVA showed significant interaction effects for the 10 and 20 m ST (10 m; p = .05, 2 = .012; 20 m: p = .002, 2 = .028), the CMJ (p < .001, 2 = .079), and the PJ (p = .002, 2 = .025). Post hoc pairwise comparisons showed differences only for S regarding 10 and 20 m ST (10m: -0.04 ± 0.05 s, pTukey = 0.018; 20 m -0.09 ± 0.08 s, pTukey = <.001) as well as for CMJ (4.88 ± 2.32 cm, pTukey = <.001) and PJ (3.93 ± 2.53 cm, pTukey = <.001). No differences were found for 5 m ST, RJ and CH. CONCLUSION:

The results support the effectiveness of sand as a training surface, primarily for speed and jumps with longer ground contact times that are determined by the concentric force development. This is likely due to the force-absorbing nature of the surface, resulting in increased muscle activation and longer ground contact times. However, the same characteristic leads to a deficiency in reactive force development out of the short stretch-shortening cycle, which is reflected by the lack of improvement in RJ and CH for S. **REFERENCES:**

[1] Gottlieb, R., Shalom, A., & Calleja-Gonzalez, J. (2021). Physiology of Basketball – Field Tests. Review Article. Journal of Human Kinetics, 77(1), 159–167. https://doi.org/10.2478/hukin-2021-0018

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