The Effectiveness Of Injury Prevention Programs In Reducing Lower Extremity Injury Risk In Basketball Players: A Systematic Review And Meta-Analysis

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INTRODUCTION

- Injury rates are concerning in basketball players with up to 60–70% affecting the lower extremity (Agel 2007).
- The most common lower extremity injuries are in the ankle and knee and involve different levels of ligament damage (Agel 2007).
- There are a variety of different types of intervention programs that help prevent and reduce risk of injury, such as bracing, taping, neuromuscular training, and use of orthotics (Verhagen 2010, McKeon 2008).
- Intervention programs vary considerably, with some implemented in the pre-season, and others spanning the duration of the playing season (Kaminski 2013, Pfeiffer 2006).
- While these studies have shown success in preventing and reducing lower extremity injury in the general population, there have been no specific reports on the effectiveness of these intervention programs in basketball players (Kerkhofs 2012).

PURPOSE

The purpose of this study was to (1) examine the effectiveness of lower extremity injury prevention programs (IPP) in basketball players and (2) identify the most effective type of intervention in this population.

METHODS

- A systematic review and meta-analysis were performed according to PRISMA guidelines by searching PubMed, CINAHL, SPORTDiscus, and Cochrane Central Register of Controlled Trials.
- Articles included (1) were prospective studies in competitive adolescent and young adult basketball players, and (2) reported gross lower extremity injury rates.
- Interventions were categorized by the use of external support (bracing, taping, and orthotics) or neuromuscular training (balance and strength training).
- Meta-analysis was performed, producing a pooled odds ratio estimate of the overall effects of IPP on lower extremity rates.
- A subgroup analysis was performed to compare the effectiveness of both types of intervention.

RESULTS

- Five studies met the inclusion criteria and were included in the review and analysis (Figure 1). Two studies using external support and three using neuromuscular training were identified (Table 1).
- Results of the meta-analysis revealed no significant reduction of lower extremity injury in basketball players (Odds Ratio (OR) estimate 0.98, 95% CI 0.58 – 1.65; p=0.94) (Figure 2).
- Results of the subgroup analysis revealed significant reduction of injury with neuromuscular training (OR 0.72, 95% CI 0.55 – 0.94; p=0.031) and increase of injury with the use of external support (OR 1.96, 95% CI 1.22 – 3.17; p=0.006) (Figure 2).

DISCUSSION

- Overall, injury prevention programs do not significantly reduce the risk of lower extremity injury in basketball players, though neuromuscular training programs may prove beneficial in reducing injury risk.
- Plyometric and agility training may be most beneficial, as they most closely resemble the sport-specific demands of basketball (jumping, lateral shuffling).
- More research regarding the effect of external support on the protected and adjacent joints is warranted, considering the possibility of increased injury risk found in this analysis.

CONCLUSIONS

- The effectiveness of lower extremity injury prevention programs in basketball players remains unclear.
- Results suggest that neuromuscular training may be more effective than the use of external support in reducing lower extremity injury risk in basketball players.
- Due to the heterogeneity and small sample size, results need to be interpreted with caution.

REFERENCES