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Research Paper Review

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The FIFA 11+ Program Is Effective in Preventing Injuries in Elite Male Basketball Players: A Cluster Randomized Controlled Trial

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ABSTRACT

Background: *Recently, structured training programs for sports injury prevention ("The 11" and "The 11+") have been validated in soccer. The FIFA 11+ program has not been evaluated in basketball.*

Hypothesis: *The FIFA 11+ program is effective in reducing the rates of injury in male basketball players.*

Study Design: *Randomized controlled trial; Level of evidence, 1.*

Methods: *The authors randomized 11 teams of the same club. Seven teams were allocated to the intervention group (80 players; mean [SD] age 13.5 [2.3] years), and 4 teams were allocated to the control group (41 players; mean [SD] age 15.2 [4.6] years). The authors conducted an injury surveillance program during a 9-month season. The primary outcome was any injury to the athletes. The secondary outcome was any injury to the lower extremity (foot, ankle, lower leg, knee, thigh, groin, and hip). They included an analysis of the type of exposure (match or training), injury location in the body, and type of injury (acute or overuse).*

Results: *During the 9-month season, 23 (19%) of the 121 players included in the study sustained a total of 31 injuries (14 in the intervention group and 17 in the control group). In the intervention group, injury rates per 1000 athlete-exposures were lower than those in the control group, with statistical significance, for overall injuries (0.95 vs 2.16; P = .0004), training injuries (0.14 vs 0.76; P = .007), lower extremity injuries (0.68 vs 1.4; P = .022), acute injuries (0.61 vs 1.91; P < .0001), and severe injuries (0 vs 0.51; P = .004). The intervention group also had statistically significant lower injury rates for trunk (0.07 vs 0.51; P = .013), leg (0 vs 0.38; P = .007), and hip and groin (0 vs 0.25; P = .023) compared with the control group. There was no statistically significant difference in match injuries, knee injuries, ankle injuries, and overuse injuries between 2 groups. The most frequent acute injury diagnoses were ligament sprains (0.41 and*

0.38 in the intervention and control groups, respectively; P < .006) and contractures (0.76 and 0.07 in the control and intervention groups, respectively; P < .003).

Conclusion: *The FIFA 11+ warm-up program is effective in reducing the rates of injuries in elite male basketball players.*

ANALYSIS

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Background Information

Physically demanding sports such as basketball can result in a number of injuries such as ligament sprains, muscle/tendon sprains, contusions, fractures, and concussions. It has been proposed that an injury prevention program is needed for basketball – this could, of course, be said for many sports (1). 'The 11' and 'The 11 +', two injury prevention programs developed by the Federation Internationale de Football Association (FIFA), were found to be effective for certain injuries in soccer such as knee injuries, lower extremity injuries, overall injuries, severe injuries, and overuse injuries such as lower extremity tendon pain and low back pain (2-4). Data suggests that the success of the program can be transferred to another sport with similar exercises. Therefore, the aim of this study was to evaluate the 'FIFA 11+' in basketball.

PERTINENT RESULTS

- Athletes in the intervention group played a total of 23,640 hours of basketball and athletes in the control group played a total of 12,648 hours.
- During the 9-month season, 23 (19%) of the 121 players included in the study sustained a total of 31 injuries (14 in the intervention group and 17 in the control group).
- *Significantly lower rates of overall injuries, training injuries, lower extremity injuries, and severe injuries were found in the intervention group as compared to the control group. The intervention group also had a significantly lower risk of trunk, leg, hip, and groin injuries. .*
- There was no statistically significant difference in match injuries, knee injuries, ankle injuries, and overuse injuries between the intervention and control groups. Because females are at a higher risk of these types of injuries, the baseline rate of these injuries in this study using males may have been too low to create a statistically significant difference. Also, because the program was originally created for soccer, it may not be as effective in basketball, where jumping, twisting, and hopping occur much more frequently and in more restricted spaces.
- The most frequent acute injury diagnoses were ligament sprains and muscle contractures in both groups. The most frequent overuse injury diagnosis was tendinopathy and moderately severe injuries were the most frequent injury in both groups.
- Overall, the authors found a 68% reduction in the number of injured players who used the program.

CLINICAL APPLICATION & CONCLUSIONS

The FIFA 11+ warm-up program is effective in both reducing the injury rate and preventing injuries in elite male basketball players. Just as in soccer, programs to improve strength, awareness, and neuromuscular control of static and dynamic movements should be implemented early on in young basketball players, as well as forming a consistent part of warm-up procedures during training and competition.

STUDY METHODS

Eleven teams of elite male basketball players in the same club were cluster randomized (to minimize bias). To be included in the study, teams had to carry out at least one training session a week in addition to match play. Both groups practiced a training program 3 to 4 times a week during the season. Seven teams (80 players) were randomized to the intervention group and four teams (41 players) to the control group. The teams in the control group warmed up as usual and the teams in the intervention group warmed up using the program from FIFA.

The program consisted of 3 parts:

1. Running exercises at slow speed combined with active stretching and controlled contacts with a partner. The running course included 6 to 10 pairs of cones.
2. A set of exercises, including strength, balance, jumping exercises, and Nordic hamstring exercises.
3. Speed running combined with basketball-specific movements with sudden changes in direction.

Coaches and team captains were provided training and instructional materials on the program exercises. The players were encouraged to focus on correct execution of the movements to increase awareness and neuromuscular control. Coaches were contacted throughout the 9 month season in an attempt increase compliance to the program.

Outcome measures included type of injury, type of exposure, and location in the body. Secondary measures included any injury to the lower extremity. Injury data came from daily reports submitted by coaches. Once submitted, injuries were classified through consensus, and players were then referred to an appropriate health professional. Data analyses (based on intention-to-treat) performed included the Pearson's x2 test "exact" based on Monte Carlo simulation, Odds ratios, 95% confidence intervals, and Cox regression. A formula was developed to calculate estimated injury rates. Mean values of participation hours and athlete-exposure were compared between the groups using the t test. A P value $< .05$ was considered significant. Calculations were devised to estimate injury rates and exposure time.

STUDY STRENGTHS / WEAKNESSES

Strengths of this study include the fact that it was cluster randomized, had 100% compliance and zero drop-outs. Also, both groups averaged a similar amount of participation and exposure hours. All teams belonged to the same club, which supported correct implementation of the program, which was also a strength. A weakness of the study included the control group teams not having a standardized warm-up program – therefore we don't know what exercises or movements they were using. In addition, teams were made aware of the program, which could have created a bias. Another limitation of this study was

that only the coaches and captains of the intervention group were instructed in person, and the survivor effect (younger athletes who get injured do not continue to play in future seasons) may have come into play.

Additional References

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