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Football Injury Prevention and Rehabilitation: A Narrative Review

Linyu Qi, Caiyu Sun, Zhibo Liu, Ruitian Huang, Qingguang Liu*

Tongji University International Football Institute, Shanghai 200092, China

Author to whom correspondence should be addressed.

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Abstract: *Objective:* To summarize the evidence on risk screening, injury prevention, and rehabilitation in football and to construct a practical continuum for training and return-to-play management. *Methods:* PubMed, Web of Science, and CNKI were searched using terms related to football/soccer injuries, injury prevention, FIFA 11+, Nordic hamstring exercise, proprioceptive training, and return to play. Evidence was synthesized around epidemiology, screening, preventive training, rehabilitation stages, and return-to-play decision-making. *Results:* The ankle, knee, hamstring, and groin were key regions for prevention. SEBT, YBT, FMS, previous injury history, and workload monitoring can support risk stratification. FIFA 11+, Nordic hamstring exercise, proprioceptive training, and core-stability training have practical value, although implementation and adherence influence outcomes. *Conclusion:* Football injury management should be organized as a closed-loop system integrating screening, prevention, rehabilitation, and return-to-play evaluation, with adherence and workload monitoring as essential implementation factors.

Keywords: Football; Sports injury; Injury prevention; Rehabilitation; Return to play

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1. Introduction

Football combines high-speed running, abrupt deceleration and changes of direction, jumping and heading, physical contact, and repeated kicking. These demands place considerable stress on lower-limb strength, joint stability, neuromuscular control, and cardiorespiratory capacity. As participation in school, professional, and recreational football continues to grow, greater exposure has made injury prevention and management increasingly important. Football injuries occur frequently and often recur; previous injury is an important and consistent risk factor for subsequent injury [1,2]. Beyond interrupting training and competition, injury may lead to persistent joint dysfunction, fear of movement, and withdrawal from sport.

Existing research has generated evidence on risk screening, neuromuscular and flexibility training, kinesiology taping, core training, and proprioceptive exercise. In practice, however, prevention and rehabilitation are often treated as separate activities, screening results are not consistently translated into individualized training prescriptions, and return-to-play decisions may still depend heavily on experience or

elapsed time. This review therefore integrates the available evidence in a practice-oriented framework and addresses three questions: how football injury risk can be recognized, how preventive methods can be matched to athlete characteristics and training phases, and how rehabilitation can be progressed toward safe return to training and competition.

2. Materials and methods

A narrative review and literature-based synthesis were undertaken. PubMed, Web of Science, CNKI, and relevant journal sources were searched using the English terms “football/soccer injury,” “injury prevention,” “FIFA 11+,” “Nordic hamstring exercise,” “proprioceptive training,” and “return to play,” together with the Chinese terms for football injury, injury prevention, risk screening, rehabilitation training, functional training, and return-to-play assessment. Priority was given to systematic reviews, meta-analyses, randomized controlled trials, prospective cohort studies, and empirical studies with clearly described training interventions.

Data extraction focused on four domains: injury location and risk factors; the content and limitations of screening tools; the mechanisms and implementation conditions of preventive interventions; and rehabilitation stages and return-to-play indicators. Because the included studies differed substantially in age, sex, competitive level, injury definitions, exposure periods, and adherence, no statistical pooling was attempted. Instead, findings were organized as an evidence-informed narrative and a practical framework. The suitability levels in Figure 2 are qualitative judgments derived from this synthesis and should not be interpreted as directly comparable effect sizes.

3. Screening for football injury risk

Football injury risk is multifactorial. Previous injury, movement control, strength asymmetry, joint range of motion, training load, fatigue, and psychological stress may interact rather than act independently. Screening should not be used simply to label an athlete as “high risk.” Its more useful purpose is to identify modifiable deficits early and translate them into a training prescription. A systematic review of lower-limb injury-prediction tools in team sports suggests that dynamic balance, movement quality, and injury history have practical value, but no single test can independently predict injury [3].

3.1. Dynamic balance and movement-quality screening

SEBT and YBT both emphasize postural control during single-leg support and therefore capture coordination among the ankle, knee, hip, and trunk in closed-chain movement. Changes of direction, landing, and contact situations in football all rely on dynamic balance, making these tests suitable for preseason screening, post-injury reassessment, and monitoring across a training cycle. FMS focuses more strongly on basic movement patterns and can help coaches identify problems in squatting, lunging, trunk stability, and hip mobility. A movement screen should not be reduced to a single “cut-off score”; its main value lies in directing individualized corrective exercise.

3.2. Stratified identification of risk factors

Common modifiable risk factors include insufficient eccentric hamstring strength, an imbalanced quadriceps-to-hamstring ratio, inadequate hip-abduction or external-rotation control, restricted ankle mobility, poor core

stability, greater knee valgus after fatigue, and abrupt increases in acute training load. Neuromuscular factors are closely related to knee and ankle-ligament injury in male youth players [4], while fatigue and age may further alter risk [5]. Teams should therefore use a tiered screening process and monitor more frequently when an athlete has a previous injury, marked asymmetry, or substantial workload fluctuations.

4. Football injury-prevention strategies

Prevention should be organized around the football-specific movement chain. Warm-up increases neuromuscular readiness; strength training improves tissue capacity; balance and core exercises refine movement control; flexibility work maintains joint mobility; and taping or bracing can provide short-term assistance in selected situations. These methods are complementary rather than interchangeable and should be combined according to the athlete's risk profile and the phase of training.

4.1. FIFA 11+ and comprehensive neuromuscular training

FIFA 11+ is a widely used comprehensive warm-up for football injury prevention. Its value is not attributable to a single exercise but to the integration of running, strength, balance, core stability, jump-landing, and agility control into a reproducible sequence. Randomized trials and systematic reviews indicate that comparable neuromuscular programs can reduce football injury risk, although the magnitude of benefit depends strongly on frequency, movement quality, and team adherence [6–10]. Successful implementation therefore requires coach education, feedback, and institutionalized delivery rather than simply distributing a warm-up checklist.

4.2. Targeted protection of the hamstring, knee, and ankle

Hamstring injuries commonly occur during high-speed running, acceleration, and kicking and have a substantial recurrence burden. The Nordic hamstring exercise increases eccentric capacity and is an important component of strain prevention; systematic reviews and meta-analyses suggest that including it in prevention programs can markedly reduce hamstring injury incidence [11,12]. Knee protection should emphasize hip–knee–ankle alignment, landing absorption, and trunk control. Ankle protection is best approached through a combination of balance work, foot-and-ankle strength, restoration of mobility, and, when indicated, taping or external support.

5. Rehabilitation pathway for football-related injuries

The central aim of rehabilitation is to move beyond symptom reduction toward restored function and, ultimately, the ability to tolerate football-specific match demands. Pain relief alone is insufficient. Strength symmetry, dynamic balance, acceleration and change-of-direction capacity, sprinting, psychological readiness, and the response to training load should all be considered before return to play.

5.1. Proprioceptive and balance training

Proprioceptive training improves joint position sense, kinesthesia, and reflexive stability, thereby supporting postural control in unstable environments. For athletes recovering from ankle sprains or knee-ligament injuries and entering late-stage return to training, balance boards, single-leg stance, perturbation drills, eyes-closed control, and ball-based balance tasks are practical options [13,14]. Progression should move from static to

dynamic tasks, from stable to unstable surfaces, and from non-ball control to football-specific actions. High-speed cutting should not be introduced while control quality remains inconsistent.

5.2. Core and functional training

Core stability provides a foundation for force transfer and control of the center of mass during football skills. Core training should not be limited to sit-ups; it should include anti-extension and anti-rotation work, lateral stability, hip–trunk coordination, and dynamic force transfer. Functional training extends this principle to the whole movement chain by incorporating squats, lunges, single-leg deadlifts, lateral movement, jump landing, and agility and change-of-direction drills. Research suggests that combining core training with small-sided games can improve physical performance in young players, while functional training can help correct movement dysfunction and improve training quality [15-18].

5.3. Return-to-play decisions and load management

Return-to-play decisions should not rely solely on elapsed time or subjective confidence. A safer approach combines pain-free ROM, strength symmetry, dynamic balance, jump and change-of-direction tests, completion of football-specific skills, psychological readiness, and the athlete's response to training load. Early reintegration can follow a graded sequence: individual training, non-contact team training, restricted contact, full training, limited match minutes, and unrestricted competition. Symptoms should be reviewed over the subsequent 24–48 h at each step. A rebound in pain, increasing swelling, or compensatory movement warrants regression to the previous stage.

6. Discussion

The available evidence suggests that the key challenge is not finding one "best" exercise but building a management system that can be delivered consistently. Screening tools can reveal movement-control and functional deficits, and they may contribute to risk reduction when findings are translated into a specific training prescription. FIFA 11+, Nordic hamstring exercise, and proprioceptive training have clear practical value, yet their effects remain dependent on coaching quality, athlete adherence, dose, and periodization.

At the team level, three simple records are useful. An injury log should include the site and mechanism of injury, time lost, and recurrence. A workload log should capture training duration, match exposure, session rating of perceived exertion (session-RPE), and sprint or change-of-direction load. A function log should track YBT, jump, strength, and football-specific movement tests. Combining these records shifts injury management from episodic judgment toward continuous monitoring. Even schools and community teams without a full sports-medicine staff can improve protection by adopting a simplified screen, a standardized warm-up, and a criterion-based return-to-training pathway.

This review has limitations. The included studies varied in age, sex, competitive level, and injury definition, so a narrative synthesis was used instead of a meta-analysis; the conclusions are therefore best viewed as a practical framework. The effects of kinesiology taping, in particular, may depend on application technique, injury type, and expectation, and taping cannot replace strength or movement-control training. Future work should evaluate football-specific interventions over longer follow-up periods and in real training environments, with stronger evidence for women's football, youth football, and recreational participants.

7. Conclusion

Football injury prevention should begin with risk screening and combine SEBT, YBT, FMS, previous injury history, and workload monitoring to create a repeatable and traceable risk-stratification process.

FIFA 11+, Nordic hamstring exercise, dynamic stretching, core-stability work, and proprioceptive training should be incorporated into routine football conditioning, with dose adjusted for age, competitive level, previous injury, and season phase.

Post-injury rehabilitation should progress through acute protection, functional recovery, sport-specific strengthening, and return to training and competition. Return-to-play decisions should be based on functional criteria and load tolerance rather than rest time alone.

Disclosure statement

The authors declare no conflict of interest.

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