Impact of the FIFA 11+ Warm-up Program on Injury Prevention in Soccer Players and Other Sports: A Systematic Review

Reza Sharifatpour¹, PhD; Hamid Abbasi¹, PhD; Saeed Abedinzadeh¹*, PhD

¹Department of Sport Sciences, Yazd University, Yazd, Iran

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ABSTRACT

Background: This study systematically reviewed scientific literature regarding the effects of the FIFA 11+ warm up program on preventing injuries in soccer and other sports.

Methods: We performed a systematic review and conducted a keyword search on 10/09/2022, in PubMed, Google Scholar, CINHAL, Web of Knowledge, Cochrane, Scopus in English language, also in Magiran, SID, Google Scholar, and Noormags in Persian language were reviewed.

Results: The results of the study were from 1192 English papers and 143 Persian papers, finally 73 eligible studies were selected and a total of 18378 players were studied. The quality level of the studies was at Level II, Twenty studies, which were at least Level II. Analysis of studies shows that the FIFA 11+ warm-up program for the prevention of sports injuries had positive effects and improve the performance of soccer players.

Conclusion: One type of training for an amateur or professional group will not have the same effect and the intensity and duration of the program should be optimized. It is also necessary for the other sports to become more specialized in preventing injury programs.

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Introduction

Soccer stands out as one of the most beloved sports worldwide, yet it also carries a significant risk of injury. Previous studies have underscored the heightened prevalence and risk of injuries within soccer [1]. Research indicates that the incidence of injuries in soccer surpasses that of other field sports [1].

Among male soccer players, the prevalence of sports injuries is estimated to range from 10 to 35 injuries per 1,000 hours of match play, translating to an occurrence of injuries in elite soccer players at least once per year [2]. Remarkably, between 65% and 95% of these injuries manifest in the lower extremities [1, 3], emphasizing the imperative to address these specific injuries to enhance the safety and well-being of soccer players. Implementing preventive programs becomes paramount to mitigating injuries and alleviating their substantial costs. Fundamental to these programs is thoroughly comprehending the mechanisms and causes of injuries [4].

Numerous studies have been conducted in the realm of soccer injury prevention, employing a variety of training methods and exercises. Warm-up programs have emerged as one of the most common preventive measures across various sports, including soccer [5].

A pivotal milestone in this area was marked by Ekstrand et al.’s pioneering study three decades ago [6, 7]. This study, conducted by Ekstrand and Gilkovist in 1983, implemented a comprehensive program for Swedish professional male soccer players, encompassing various preventive measures such as specialized exercises, modified training routines, and equipment adjustments. The findings of this study revealed a remarkable 75% decrease in injuries among the players. However, the multifaceted nature of the interventions employed in this
Methods

This systematic review study aimed to examine published research articles in both English and Persian languages, focusing on the effectiveness of the FIFA 11+ warm-up program in preventing soccer injuries. The search, conducted as of 10/09/2022, yielded 1192 English articles and 143 Persian articles across various scientific databases. Specifically, 34 articles were identified in PubMed, while 1158 were found through databases such as Google Scholar, Web of Knowledge, Scopus, Cochrane, and CINHAL. Additionally, seven articles were retrieved from Magiran, three from SID, 128 from Google Scholar, and five from Noormags, all in Persian. The inclusion criteria for articles encompassed studies that investigated exercises incorporated within the FIFA 11+ warm-up program, as well as articles evaluating the overall impact of this program on injury prevention in soccer.

The search strategy employed a combination of English and Persian keywords. For English databases, the search utilized the following keywords: (football OR soccer OR handball OR basketball OR futsal) AND (fifa-11 OR fifa-11 + OR fifa-11-plus) AND injury. ((“football” [MeSH Terms] OR “football” [All Fields]) OR (“soccer” [MeSH Terms] OR “soccer” [All Fields]) OR handball [All Fields] OR (“basketball” [MeSH Terms] OR “basketball” [All Fields]) OR futsal [All Fields]) AND (fifa-11 [All Fields] OR fifa-11+ [All Fields]) AND (“wounds and injuries” [MeSH Terms] OR (“wounds” [All Fields] AND “injuries” [All Fields]) OR “wounds and injuries” [All Fields] OR “injury” [All Fields])

For Persian databases, the search terms included variations of “FIFA 11,” “prevention,” and “injury” in the Farsi language.

Results

After identifying 901 articles, the titles and abstracts were reviewed by two members of the team (HA and RSH).

<table>
<thead>
<tr>
<th>The number of titles found from the search in the bases</th>
<th>English Number=192</th>
<th>Persian Number=143</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of study due to irrelevance</td>
<td>English (Number=103)</td>
<td>Persian (Number=126)</td>
</tr>
<tr>
<td>Full-text articles assigned</td>
<td>English (Number=99)</td>
<td>Persian (Number=17)</td>
</tr>
<tr>
<td>(Number=106)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out of study due to non-compliance with entry criteria</td>
<td>English (Number=60)</td>
<td>Persian (Number=9)</td>
</tr>
<tr>
<td>Analyzed</td>
<td>English (Number=29)</td>
<td>Persian (Number=8)</td>
</tr>
<tr>
<td></td>
<td>(Number=37)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Articles selection process based on the Prisma model (October 2009)
The inter-rater agreement, calculated using Kappa statistics, yielded a significant result (Kappa 0.73), indicating substantial agreement (Landis & Koch, 1977) [17]. Following this initial screening, 39 relevant articles were subjected to thorough examination. Ultimately, 36 eligible studies were selected for inclusion in this study (Figure 1). Among the reviewed articles, 16 randomized controlled trials (RCTs) were clustered at level II.

Quality of Papers: Eight papers were identified as Persian articles (Table 1). Among them, two studies [18, 19] were categorized as level II [20] RCTs (American Academy of Orthopedic Surgery, 2008). Four studies employed purposive sampling and included a control group. At the same time, one article conducted a comparative study, comparing the FIFA 11 warm-up program with its modified version without a control group or comparing FIFA 11+ with a modified version of FIFA 11+ [21]. In the English papers (Table 2), ten studies were classified as RCTs and level II evidence.

Subjects: In most studies, the number of subjects was mentioned, with only two studies [24, 25] reporting the number of teams instead of individual subjects. A total of 10,866 players were included in the reviewed studies, and in those papers reporting the number of teams, a total of 166 teams were investigated. Five studies were conducted exclusively on women, while the remaining included male subjects. It is noteworthy that all subjects in Persian language studies were male.

Since 2008, FIFA “11” has been extensively studied, and the FIFA “11+” program was introduced by Soligard et al. in the same year. Since then, this enhanced FIFA Program has been widely adopted and implemented.

Table 1: Studies about FIFA 11 in Iran

<table>
<thead>
<tr>
<th>Researcher and year of study</th>
<th>Count</th>
<th>Age</th>
<th>Gender</th>
<th>Features</th>
<th>Method</th>
<th>Intervention</th>
<th>Duration, frequency, severity, and duration of intervention</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sadeghipoor et al. 2012 [42]</td>
<td>24</td>
<td>19-20 years</td>
<td>Male</td>
<td>Isfahan Clubs</td>
<td>Targeted sampling available to the control group</td>
<td>FIFA 11+</td>
<td>Three times a week, two months</td>
<td>It increases the isometric strength of the quadriceps muscle, which is a factor in preventing injury. However, it did not affect hamstring muscle strength.</td>
</tr>
<tr>
<td>Minonezhad et al. 2014 [43]</td>
<td>104</td>
<td>14-18 years</td>
<td>Male</td>
<td>Tehran League</td>
<td>Case study by comparing two methods</td>
<td>54 players modified 11+ group 50 players 11+ group</td>
<td>24 weeks for 6 months twice a week</td>
<td>Although the FIFA Training Team 11+ was moderated, it was about 43% less likely than FIFA 11+; but this was not statistically significant.</td>
</tr>
<tr>
<td>Zarei et al. 2015 [18]</td>
<td>35 team 980 players, control: 476, intervention: 504 players</td>
<td>15-19 years</td>
<td>Male</td>
<td>Iranian youth football</td>
<td>Randomized controlled clinical trial</td>
<td>FIFA 11+</td>
<td>Twice a week during 30 weeks control group: regular exercises</td>
<td>There were 67383 hours of players’ activity and 1220 injuries. The incidence of ankle injuries in the intervention group (65.3 injuries per thousand hours) was lower than that of the control group (6.84)</td>
</tr>
<tr>
<td>Zarei et al. 2015 [19]</td>
<td>4 team 66 players, control: 32 intervention: 34 players</td>
<td>14-16 years</td>
<td>Male</td>
<td>Asian Premier League of Vision</td>
<td>cluster randomized controlled trial (CRCT)</td>
<td>FIFA 11+</td>
<td>In season (30 weeks) control group: regular exercises</td>
<td>Increase the vertical jump of the Sargent, countermovement jump, and anaerobic power of the lower limb muscles of youth soccer players</td>
</tr>
<tr>
<td>Ghasemi et al. 2016 [22]</td>
<td>24</td>
<td>16-20 years</td>
<td>Male</td>
<td>Youth Football Premier League of Mazandaran Province</td>
<td>Random block with control group</td>
<td>12 experimental and 12 FIFA warm-up programs in the experimental group</td>
<td>Three times a week 8 weeks</td>
<td>Neuromuscular features of the lower limb are improved, potentially reducing the risk of ACL injury during landing</td>
</tr>
<tr>
<td>Soltandoust nari et al. 2017 [23]</td>
<td>30</td>
<td>14-16 years</td>
<td>Male</td>
<td>Mashhad teenage footballers</td>
<td>Random with the control group</td>
<td>The FIFA 11+ in the experimental group</td>
<td>3 sessions per week for 8 weeks at evening time for 30 weeks</td>
<td>Reductions in the anterior knee shearing force after performing FIFA 11+ showed a significant difference between the ankle shear force in the training group and the control group</td>
</tr>
<tr>
<td>Ebrahim et al. 2017 [44]</td>
<td>30</td>
<td>14 to 16 years</td>
<td>Male</td>
<td>Young soccer players</td>
<td>Random with Control Group</td>
<td>The experimental group performed the FIFA 11+ program</td>
<td>3 times a week for 8 weeks</td>
<td>FIFA 11+ could increase dynamic postural stability by improving neuromuscular coordination and proprioception</td>
</tr>
<tr>
<td>Kheirroddin et al., 2017 [21]</td>
<td>111</td>
<td>14-18 years</td>
<td>Male</td>
<td>Tehran League</td>
<td>Case study by comparing two methods</td>
<td>54 players of modified 11+ (adding wobble board) and 57 player control</td>
<td>24 weeks for 6 months twice a week</td>
<td>Despite a 55.88% decrease in the incidence of ankle injuries in the intervention group</td>
</tr>
</tbody>
</table>
Table 2: FIFA 11 and soccer studies

<table>
<thead>
<tr>
<th>Researcher and year of study</th>
<th>Sample</th>
<th>Intervention</th>
<th>Method</th>
<th>Duration, frequency, severity, and duration of intervention</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilding and et al. 2008 [26]</td>
<td>24 players</td>
<td>12 athletes in the experimental group performed the FIFA 11+</td>
<td>Random with Control Group</td>
<td>5 times a week for 6 weeks.</td>
<td>No injury was observed in the intervention group during the study. Significant increases were also reported in improving performance and preventing injury.</td>
</tr>
<tr>
<td>Steffen and et al. 2008 [9]</td>
<td>34 players</td>
<td>The effect of FIFA 11+ on the prevalence of injury in the intervention group</td>
<td>Cluster RCT</td>
<td>Duration: 15 minutes; 3 times a week for 10 weeks</td>
<td>The intervention did not affect the incidence of injury</td>
</tr>
<tr>
<td>Soligard and et al 2008 [10]</td>
<td>2729 players</td>
<td>The effect of FIFA 11+ on the prevalence of lower limb injuries</td>
<td>Cluster RCT</td>
<td>Duration: 20 minutes; 3 times a week, 8 months</td>
<td>Injuries in the intervention group were 32% lower than in the control group. The risk of injury from excessive use was 53%, and severe injury decreased by 45%. 46% less injury in coaches who adhered to the program moderately, and Instructors who had more adherence to the program had 35% fewer injuries in all types of injuries</td>
</tr>
<tr>
<td>Soligard and et al 2010 [27]</td>
<td>1055 players</td>
<td>The effect of FIFA 11+ on the prevalence of injury in the experimental group</td>
<td>Cluster RCT</td>
<td>Duration: 20 minutes; 2 times a week, 8 months</td>
<td>The FIFA 11+ program reduces lower limb injury and improves balance and strength</td>
</tr>
<tr>
<td>Brito and et al. 2010 [5]</td>
<td>20 players</td>
<td>The effect of the FIFA 11+ in the experimental group</td>
<td>One Group</td>
<td>3 times a week; For 8 weeks</td>
<td>There were no differences in the incidence and severity of injuries in the two groups during the training and the competitions</td>
</tr>
<tr>
<td>Beijsterveldt and et al 2010 [28]</td>
<td>310 players</td>
<td>Control group: 155 athletes, 12 clubs</td>
<td>Semi-Professional</td>
<td>Duration: 20 minutes; 2 times a week; It was done in a season.</td>
<td>The FIFA 11+ program does not adversely affect the leg injury rate compared to the baseline level competition and prevents injury.</td>
</tr>
<tr>
<td>Junge and et al 2011 [25]</td>
<td>5549 coaches</td>
<td>Practice twice a week and one match per week.</td>
<td>Swiss Football Federation</td>
<td>Practice twice a week and one match per week.</td>
<td>The injury prevalence in the teams that performed this program was reduced by 11.5% in the competition and 25.3% in the training.</td>
</tr>
<tr>
<td>Gatterer and et al 2012 [24]</td>
<td>3 team</td>
<td>The effect of education and implementing the FIFA 11+ program in trained teams</td>
<td>Amateur</td>
<td>First half of Italian Amateur League</td>
<td>The risk of injury to players with high adherence was 5% lower than the FIFA 11+ program.</td>
</tr>
<tr>
<td>Steffen et al. 2013 [29]</td>
<td>266 players</td>
<td>The FIFA 11+ program and its effect on the prevalence of injuries in the intervention group</td>
<td>Cluster RCT</td>
<td>Duration: 20 minutes; 5-6 times a week for 2 seasons</td>
<td>The relative risk of lower limb injury was 72% in professional players than in the training.</td>
</tr>
<tr>
<td>Groom et al. 2013 [30]</td>
<td>41 players</td>
<td>The effect of FIFA 11+ on the prevalence of injury in the experimental group</td>
<td>Academic</td>
<td>Duration: 20 minutes; 2 times a week; The intervention group had 35% fewer injuries than the control group.</td>
<td>There were no differences in the incidence and severity of injuries in the two groups during the training and the competitions</td>
</tr>
<tr>
<td>Owwey et al. 2014 [31]</td>
<td>416 players</td>
<td>Six months each week to evaluate players for injury and loss time</td>
<td>Cluster RCT</td>
<td>Six months each week to evaluate players for injury and loss time</td>
<td>The FIFA 11+ program effectively decreases the overall injury rate by 41 percent for male youth soccer players.</td>
</tr>
<tr>
<td>Hamme et al. 2015 [32]</td>
<td>256 players</td>
<td>The effect of FIFA 11+ program on the prevalence of injuries in the experimental group</td>
<td>Cluster RCT</td>
<td>Duration: 9 months, 20 minutes; Once a week for one season</td>
<td>The risk of injury to players with high adherence was 57% lower than the FIFA 11+ program.</td>
</tr>
<tr>
<td>Silvers-Granelli et al. 2015 [33]</td>
<td>61 players</td>
<td>The effect of FIFA 11+ program on reducing injury</td>
<td>Cluster RCT</td>
<td>Duration: 20 minutes; 3 times a week throughout the 2012 season</td>
<td>The incidence rate of injury decreased. Also, loss of time was reduced due to injuries, and eventually, the number of players required for treatment also decreased</td>
</tr>
</tbody>
</table>
Regarding other sports, three studies focused on Futsal utilizing the FIFA 11 program. At the same time, a randomized controlled trial was conducted in basketball—additionally, two studies employed modified versions of the FIFA 11+ program in handball.

Most studies reported the effects of the FIFA 11+ program on the prevalence of injury, the assessment of physical fitness, neuromuscular function, and balance, while some studies have included a financial assessment of the FIFA 11+ program, such as its impact, compliance with the plan, or methods of performing. In general, most studies reported a significant reduction in injury. Of course, few studies reported the warming-up program’s low or no effect.

**Discussion**

This systematic review aimed to explore the effectiveness of the 11+ warm-up program in preventing injuries in football and other sports. The review encompassed 793 English-language papers and 98 Persian-language papers. Ultimately, 27 studies met the eligibility criteria, with 12,851 players included in the analysis.

**Quality of Papers:** This systematic review adhered to the PRISMA statement guidelines (http://www.prisma-statement.org/). Two blinded research team members (RS and HA) independently reviewed and assessed all studies. A third researcher (SA) reassessed the study in case of conflicts. The overall quality of the studies was rated as moderate to high, with 14 studies employing a randomized controlled trial design. In contrast, the remaining studies utilized prospective cohorts or non-randomized experimental designs (ref: Tables 1-3). Among these, 20 studies were classified as at least Level II according to the American Academy of Orthopedic Surgery criteria, indicating relatively good quality. However, many studies faced challenges recruiting sufficient samples, which should be considered in future
the number of knee injuries and a reduction noted significant differences between the two groups recorded, with 215 cases occurring in the control group, and 161 cases in the experimental group. The authors reduced injuries.

Field-based studies. The reviewers found a low risk of bias for allocation concealment and blinding outcome assessment across all domains.

Sample Material: Studies involving male subjects consistently reported a positive impact of FIFA 11+ exercises, except for one study where the sessions were conducted once a week, and the subjects were older, likely due to their high athleticism. Conversely, studies involving female subjects showed a positive effect in cases where the exercises were repeated or implemented over a prolonged duration [10]. In contrast, two studies reported low or no effect, possibly due to weekly meetings [9] or shorter implementation periods spanning half a season [24].

The type and intensity of the exercises: The results of the FIFA 11 warm-up program were not particularly effective or significant until 2008. However, with the program’s evolution into “FIFA 11+,” as proposed by Soligard et al. in 2008, more impactful results have been reported. The addition of two extra exercises, as well as power training elements such as the Nordic, has notably reported. The addition of two extra exercises, as well as power training elements such as the Nordic, has notably led to more significant improvements. The experimental group led by Soligard in 2010, it was observed that the FIFA 11+ group of the modified FIFA 11+ program in the intervention group. The FIFA 11+ project involved seven intervention programs in the control group, implementing the FIFA 11 warm-up program were not particularly effective or significant until 2008. However, with the program’s evolution into “FIFA 11+,” as proposed by Soligard et al. in 2008, more impactful results have been reported. The addition of two extra exercises, as well as power training elements such as the Nordic, has notably led to more significant improvements.

Table 3: Studies FIFA 11 and other sports

<table>
<thead>
<tr>
<th>Researcher and year of study</th>
<th>Count</th>
<th>Age</th>
<th>Gender</th>
<th>Sample</th>
<th>Intervention</th>
<th>Intervention Duration, frequency, severity, and duration of intervention</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longo et al. 2012 [12]</td>
<td>121</td>
<td>11-19 years</td>
<td>Male</td>
<td>Basketball player</td>
<td>Cluster RCT 7 intervention teams and 4 teams in the control group, implementing the FIFA 11+ warm-up program in the experimental group</td>
<td>During a season and 9 months</td>
<td>The FIFA 11+ effectively reduces the injury rate in male elite basketball players. The experimental group (80 players) were significantly less affected than the control group (41 players)</td>
</tr>
<tr>
<td>Reis- et al., 2013 [45]</td>
<td>36</td>
<td>16-18 years</td>
<td>Male</td>
<td>Futsal player</td>
<td>Randomized Cohort study</td>
<td>The FIFA 11+ program in the intervention group</td>
<td>2 times a week for 12 weeks</td>
</tr>
<tr>
<td>Grit- sanadilok et al. 2013 [46]</td>
<td>21</td>
<td>15-18 years</td>
<td>Male</td>
<td>Futsal player</td>
<td>Experiment with the control group</td>
<td>The FIFA 11+ program in the intervention group</td>
<td>10 weeks</td>
</tr>
<tr>
<td>Zein et al. 2013 [47]</td>
<td>20</td>
<td>15-18 years</td>
<td>Male</td>
<td>Futsal player</td>
<td>Random with the control group</td>
<td>Experimental group: FIFA 11+ Control Group: Regular exercises</td>
<td>2 times a week for 4 weeks</td>
</tr>
<tr>
<td>Parsons et al. 2017 [48]</td>
<td>47</td>
<td>9-11 years</td>
<td>Female</td>
<td>Developmental Indoor Soccer Club</td>
<td>Random with Control Group</td>
<td>FIFA 11+ program</td>
<td>2-3 per week for 5 months</td>
</tr>
<tr>
<td>Abedinza- deh et al 2017 [16]</td>
<td>48</td>
<td>-</td>
<td>Male</td>
<td>Handball player</td>
<td>With control group</td>
<td>The experimental group of the modified FIFA 11+ program</td>
<td>3 times a week for 2 months</td>
</tr>
<tr>
<td>Abedinza- deh et al 2019 [49]</td>
<td>48</td>
<td>-</td>
<td>Male</td>
<td>Handball player</td>
<td>With control group</td>
<td>The experimental group of the modified FIFA 11+ program</td>
<td>3 times a week for 2 months</td>
</tr>
<tr>
<td>Salgues et al. 2021 [50]</td>
<td>64</td>
<td>16 to 18 years</td>
<td>Female</td>
<td>Semi-professional basketball players</td>
<td>Random with two Groups</td>
<td>The FIFA 11+ group adapted to basketball and the PEP group</td>
<td>3 times a week for 9 months</td>
</tr>
</tbody>
</table>
risk of injury was lower in the group that participated more actively in the program compared to athletes with a moderate level of participation. Additionally, instructors who had fully embraced and implemented the program witnessed a 46% reduction in injuries compared to those who showed moderate commitment. Furthermore, instructors who demonstrated higher adherence to the program reported a 35% decrease in injuries [10].

One notable study demonstrating the effectiveness of the 11+ program was conducted by Jang et al. (2011) [25]. In this study, following implementing a nationwide campaign aimed at reducing injuries among amateur soccer players in Switzerland, there was a notable decrease in injury rates, with a reduction of 11.5% during matches and 25.3% during training sessions. The authors attributed this success to the successful implementation of the program across the country, resulting in fewer soccer-related injuries among amateur athletes and a consequent reduction in medical expenses. According to Swiss National Insurance Company data, 42,260 soccer-related injuries were reported in 2003, amounting to $130 million in treatment costs. The study findings underscore the potential effectiveness of a nationwide campaign to implement such warm-up programs, leading to tangible reductions in injuries and associated treatment costs.

Moreover, several review papers [51, 52] and meta-analyses published in recent years [53] have further corroborated the effectiveness of the 11+ program in reducing injuries across various anatomical areas of the body.

Impact of the program: Among the 36 studies included in our review, 22 directly investigated the reduction of injuries, while others explored various effects of the FIFA 11 warm-up program on factors such as changes in muscle activity [34], muscular strength [40-42, 50], and physical fitness [35, 38-41, 45, 47, 48, 50], as well as the reduction of knee shearing force [23].

Four studies reported either no influence or a low impact of the FIFA 11 warm-up program. These studies focused on amateur soccer or futsal players, where the timing or duration of FIFA 11 training was limited (e.g., one session per week or half a season), or the program was not modified for futsal. Nonetheless, these studies suggested that increasing the intensity and duration of the program training may lead to more favorable outcomes [28].

The study by Beijsterveldt et al. (2011) found no significant difference in injury occurrence or severity among athletes who performed the FIFA 11 warm-up program. They recommended that future studies consider the exercise’s duration and intensity, suggesting that these factors could influence the program’s effectiveness. Another study by Stefan et al. (2008) [9] also reported a lack of impact of the FIFA 11 program. Their findings may be attributed to low adherence to the program among teams in the intervention group and insufficient training sessions (only one session per week). Therefore, the authors suggested that the low adherence to the program likely contributed to the lack of reduced injury rates. In a follow-up study, Stefan et al. (2013) criticized the FIFA-provided program, noting that it fails to offer sufficient motivation for athletes to adhere to the program consistently throughout the season, which could lead to decreased adherence and, consequently, diminished effectiveness.

Therefore, it is crucial for coaching staff and athletes to recognize the significance of such exercises in injury prevention and to adhere to the prescribed programs diligently. These limitations can be addressed by enhancing awareness among coaches and athletes regarding the program’s benefits. Furthermore, adjusting the program to make it more appealing and suitable for the teams’ fitness levels could encourage greater adherence.

It is suggested that educational workshops be conducted periodically to increase educators’ understanding of injury prevention benefits and familiarity with the FIFA 11+ program. Educated and trained educators in this regard can help reduce injury incidents, enhance efficiency, and improve players’ performance. Additionally, it is recommended to customize the FIFA 11+ program for other sports to suit specific sport-related factors such as field type, injury prevalence, and mechanisms.

Iranian Studies

Studies in Iran have been conducted since 2012, primarily focusing on male athletes. Most of these studies have involved skilled players in the national league, except one study [23] that involved adolescents, although the players’ skill levels were not specified. Among these studies, four have examined the effectiveness of the FIFA 11 warm-up program in reducing injuries [18, 19, 21, 43]. Additionally, other studies have explored the program’s effects on increasing muscle strength [42], improving muscle nervous function [22], enhancing proprioception and neuromuscular coordination [44], and reducing knee shearing force [23].

FIFA 11 in Other Sports

The FIFA 11+ program has been adapted and implemented in sports, such as basketball, handball, and futsal, as summarized in Table 3. In basketball, a Cluster RCT demonstrated that the FIFA 11+ program effectively reduced injuries among elite players [12]. Salgues et al. (2021) [50] also reported improvements in various physical fitness factors, indirectly contributing to injury prevention. Among futsal players, four studies implementing the FIFA 11+ program observed enhancements in physical fitness components, including strength, agility, joint position sense, balance, and core stability, all of which are crucial for injury prevention [45-48].

In handball, a modified version of the FIFA 11+ program reduced injury rates by influencing kinetic and kinematic factors such as jump height, power, and balance, as well as increasing trunk and knee flexion angles and reducing knee valgus during landing among elite handball players [16, 49].

Conclusion

The analysis of studies indicates that implementing the FIFA 11 warm-up program for preventing sports injuries has yielded positive effects, notably reducing the risk of injury and enhancing overall safety in sports.
Integrating this program into regular training routines can be done seamlessly without consuming significant time. However, it is paramount in enhancing physical fitness, mitigating injury risks, and expediting the return to play process after an injury, ultimately contributing to improved performance among soccer players.

It is important to acknowledge that one-size-fits-all approaches may not yield identical results across diverse groups, whether amateur or professional. Thus, the intensity and duration of such programs should be optimized based on specific needs and contexts. Additionally, there is a pressing need for tailored injury prevention programs for various sports. Future research endeavors should prioritize investigating the implementation of the FIFA 11+ program, with a focus on customization for different sports, while considering factors such as the skill level, gender, and age of the participants.

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