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## RESEARCH ARTICLE

### The FIFA 11+ Injury Prevention Program Still not Implemented by the Majority of Professional and Semi-professional Soccer Players and Coaches Globally

Wesam Saleh A. Al Attar<sup>1,2,3,\*</sup>, Saud Alarifi<sup>4</sup>, Ibrahim Alramadhani<sup>1</sup>, Majed Aljabri<sup>1</sup>, Mashaer Alyami<sup>5</sup>, Muhsen Alsufiany<sup>6</sup>, Msaad Alzhrani<sup>7,\*</sup> and Hussain S. Ghulam<sup>8</sup>

<sup>1</sup>Department of Physiotherapy, College of Applied Medical Sciences, Umm Al Qura University, Makkah, Saudi Arabia.

<sup>2</sup>The Discipline of Exercise and Sport Science, Faculty of Medicine and Health Sciences, The University of Sydney, Sydney, Australia.

<sup>3</sup>Department of Sport, Exercise and Health, Faculty of Medicine, University of Basel, Basel, Switzerland.

<sup>4</sup>Department of Physiotherapy, King Abdulaziz Medical City, Riyadh, Saudi Arabia.

<sup>5</sup>Department of Physical Medicine & Rehabilitation, King Fahad Specialist Hospital, Dammam, Saudi Arabia.

<sup>6</sup>Department of Physiotherapy, College of Applied Medical Science, Sciences, Taif University, Taif, Saudi Arabia.

<sup>7</sup>Department of Physiotherapy, College of Applied Medical Sciences, Majmaah University, Majmaah, Saudi Arabia.

<sup>8</sup>Department of Physiotherapy, College of Applied Medical Sciences, Najran University, Najran, Saudi Arabia.

#### Abstract:

#### Background:

The Fédération International de Football Association (FIFA) has promoted and deployed the FIFA 11+ injury prevention program worldwide. Developed by the FIFA Medical Assessment and Research Centre (F-MARC), the program relied on the results of an international randomized controlled trial that aimed to reduce sport-related injuries and healthcare costs.

#### Objective:

The objective of this study was to assess the awareness level, implementation rate, and opinions about the effectiveness of the FIFA 11+ Injury Prevention Program among professional and semi-professional soccer players and coaches worldwide.

#### Methods:

In all, 2000 professional and semi-professional soccer players and coaches were invited to complete a self-administered questionnaire. Several authors, who are experts in sports medicine and injury prevention, participated in developing the questionnaire. The primary outcomes were awareness level, implementation rate, and opinion on the FIFA 11+ Program's effectiveness in reducing injuries.

#### Results:

A total of 1690 professional and semi-professional soccer players and coaches completed the survey (response rate: 84.5%). A total of 824 professional and semi-professional soccer players and coaches (48.8%) were aware of the FIFA 11+ Program, and 680 (83.8%) reported implementing the program in their practice. The participants who implemented the program reported a positive attitude toward the program's efficacy, with a score of  $8.20 \pm 1.10$  out of 10.

#### Conclusion:

More than half of professional and semi-professional soccer players and coaches from different continents are not aware of the FIFA 11+ Injury Prevention Program. Therefore, educating players and coaches is necessary for increased implementation and injury reduction.

**Keywords:** Sports injury prevention programs, Warm-up exercises, Football, Sports medicine, Surveys, Questionnaires.

#### Article History

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## 1. INTRODUCTION

Football (soccer) is the most widely played sport, with approximately 300 million players globally [1]. Considering the large number of soccer players, *i.e.*, more than 22 million, as estimated by the Fédération Internationale de Football Association (FIFA) [2], the frequency of soccer injuries places a significant burden on public health. The estimated injury rates in soccer range from 3.4 to 5.6 injuries per 1000 h of game participation or 22–30 injuries per 100 participants per year [3].

Injury prevention among elite soccer players is of utmost importance as injuries result in performance decline and various other negative outcomes [4], such as financial burdens [5]. Long-term rehabilitation for injured athletes also has other negative impacts [6]. Therefore, reducing the rate of injuries is important to reduce the cost of injuries and the risk of injuries [6 - 8]. Exercise-based injury prevention programs have been found to be effective in reducing the risk of sports injuries and the resulting consequences [9, 10]. Hence, the FIFA Medical and Research Centre, Santa Monica Orthopedic and Sports Medicine Research Foundation, and Oslo Sports Trauma Research Centre have collaborated to develop the FIFA 11+ Injury Prevention Program.

The FIFA 11+ Injury Prevention Program was designed to improve strength and reduce the incidence of overall injuries during soccer [11, 12]. If utilized correctly, it can address all soccer-related injuries to the knee and/or anterior cruciate ligament [13]. The FIFA 11+ program includes 15 exercises divided into three parts and is recommended to be implemented as a standard warm-up at the beginning of each training session, at least twice a week [13, 14]. Al Attar *et al.* [15] examined the preventive effects of the program. They found that it led to a reduction in the injury risk ratio of the lower limbs by 29% and of overall injury by 34%. The program is available online at no cost and is supplemented by various resources, including coaching manuals, videos, posters, and flashcards [16]. Another systematic review and meta-analysis supported the use of injury prevention programs of the F-MARC, particularly the FIFA 11+ program, to decrease the risk of injuries among soccer players [17].

The FIFA 11+ program promotes positive physiological changes in athletes, thus adequately preparing them for high-level competition [18]. The program consists of three stages, including 15 exercises in a specific sequence. Correct techniques must be used to ensure appropriate posture and body control [19 - 22]. Studies have also indicated that the presence of a qualified trainer and medical monitoring can influence the effectiveness of the FIFA 11+ Injury Prevention Program [23, 24].

Perceptions of injury risk and prevention are associated with the uptake of preventive measures among coaches [25]. Perceived susceptibility to injury [26], social influences [26, 27], and general dislike of preventive strategies [26 - 28], have all been shown to influence the implementation of preventive

strategies in various competitive and recreational sports [26 - 28]. Specifically, the perceived lack of need [14], social pressures [27], and discomfort due to protective equipment [17] have all been found to be factors associated with poor adherence to preventive interventions [14, 17, 27]. Another possible effect on adherence is the knowledge of injury risk and prevention [10]. Orr *et al.* [10] examined youth soccer coaches' and players' knowledge of knee injuries and safety practices and found significant gaps in the understanding of knee injury prevention among coaches and players. Similarly, other studies have shown that there is limited injury awareness and knowledge among coaches [23] and athletes [24] in various sports, including rugby and basketball.

The knowledge, implementation, and perceptions of injury prevention programs remain unclear. Therefore, the purpose of this study was to examine the awareness levels, implementation levels, and general perceptions of professional and semi-professional soccer players and coaches globally with regard to a well-established prevention protocol.

## 2. MATERIALS AND METHODS

### 2.1. Survey Development

An online web-based survey was used to collect information about the awareness levels, implementation rates, and opinions about the FIFA 11+ Injury Prevention Program among soccer players and coaches. The study was an international cross-sectional survey that targeted soccer players and coaches from different continental football federations. The self-administered questionnaire also included sociodemographic questions (sex, level, professional soccer player, professional soccer coach, semi-professional soccer player, semi-professional soccer coach, and country). The participants were asked about their awareness of the FIFA 11+ Injury Prevention Program. Those who reported awareness of the program were then asked about their implementation levels. The participants who participated in the FIFA 11+ program were asked about their perception of the program's efficacy on a linear scale of 0–10 points (0 = not effective to 10 = very effective). The survey was developed in English and translated to 10 languages by certified translators (Arabic, Chinese, French, German, Italian, Japanese, Portuguese, Russian, Spanish, and Turkish). This study was reviewed and approved by the Biomedical Ethics Committee at Umm Al Qura University (approval number: HAPO02K012202010458).

### 2.2. Survey Software and Administration

The survey was uploaded to an online survey software (Google Forms, Google Inc. software, Mountain View, CA, USA). The respondents were provided a link to the survey, with a brief description of the study and given only one chance to complete it. All responses were voluntary and anonymous. Two thousand professional and semi-professional soccer players and coaches were provided the survey link between June 2019 and June 2020.

### 2.3. Sample Size and Statistical Analysis

According to the most recent FIFA estimations, 300

\* Address correspondence to these authors at Department of Physiotherapy, College of Applied Medical Sciences, Umm Al Qura University, Makkah, 21955, Saudi Arabia and Department of Physiotherapy, College of Applied Medical Sciences, Majmaah University, Majmaah, Saudi Arabia;  
E-mails: wsattar@uqu.edu.sa, m.alzhrani@mu.edu.sa

million players, or approximately 4% of the world’s population, are actively involved in soccer worldwide [1]. Two thousand professional and semi-professional soccer players and coaches worldwide were contacted through e-mail via their local football federations to achieve a 2% confidence interval (CI) at a 95% confidence level. The responses were organized in Microsoft Excel 2010 (Microsoft Corporation, Redmond, WA, USA) and analyzed using the Statistical Package for the Social Sciences (SPSS), version 24.0 (SPSS Inc., Chicago, IL, USA). We calculated the frequencies and percentages of all the nominal variables. The mean, Standard Deviation (SD), and range (minimum-maximum) were calculated for the opinion score.

**3. RESULTS**

**3.1. General Results**

The study included 1690 participants from 187 countries. The participants were distributed across all the continents. One-third of the participants were from Europe, another one-third from Africa, and the rest from other continents. Most of the study participants were men (n = 1509, 89.3%). The study included 1311 players (77.6%) and 379 (22.4%) coaches at different professional levels. Table 1 outlines the characteristics of the study participants.

**Table 1. Characteristics of study participants.**

Continental Football Federations	
UEFA	571 (33.8%)
CONMEBOL	83 (4.9%)
AFC	569 (33.7%)
CAF	285 (16.9%)
CONCACAF	151 (8.9%)
OFC	31 (1.8%)
Level of Profession	
Professional Soccer Player	208 (12.3%)
Professional Soccer Coach	98 (5.8%)
Semi-professional Soccer Player	1103 (65.3%)
Semi-professional Soccer Coach	281 (16.6%)
AFC, Asian Football Confederation; CAF, Confederation of African Football; CONCACAF, Confederation of North, Central American and Caribbean Association Football; CONMEBOL, The South American Football Confederation; OFC, Oceania Football Confederation; UEFA, Union of European Football Associations	

**3.2. Awareness Levels, Program Implementation, and Opinion about Effectiveness**

Less than half of the study participants (n = 824, 48.8%) were aware of the FIFA 11+ program. Most of the participants who were aware of the program implemented it (n = 680, 82.5%). The participants who implemented the program reported a positive attitude toward the program’s efficacy, with a score of 8.20 ± 1.10 out of 10.

Table 2 outlines the level of awareness, degree of implementation, and opinions about the program’s effectiveness in each continent. The majority of the participants who were aware of the program belonged to Australia (79.4%) and Europe (64.0%) (Table 2).

**Table 2. Distribution of awareness and practice according to continents.**

Continent	Awareness		Implement		Opinion
	No	%	No	%	Range (Mean ± SD)
North America	55	50.5%	45	84.9%	5-10 (8.2 ± 1.1)
Europe	334	64.0%	271	81.6%	5-10 (8.0 ± 0.9)
Africa	87	30.1%	74	88.1%	6-10 (8.2 ± 1.0)
Asia	241	41.8%	192	81.7%	5-10 (8.3 ± 1.2)
Australia	46	79.4%	41	89.1%	6-10 (8.3 ± 1.1)
South America	61	45.2%	57	93.4%	6-10 (8.2 ± 0.9)
<b>Total</b>	<b>824</b>	<b>48.8%</b>	<b>680</b>	<b>83.8%</b>	<b>5-10 (8.2 ± 1.0)</b>

**4. DISCUSSION**

This study focused on the awareness, knowledge, and opinion of soccer players and coaches worldwide regarding the FIFA 11+ Injury Prevention Program. Globally, less than half of the participating soccer players and coaches reported that they knew about the program, and 83.8% of them used it regularly in their routine. The reason behind coaches not implementing the program could be the lack of awareness rather than the negative perceptions of its relevance and feasibility because the current study found positive opinions about the effectiveness of the program among the coaches in all the continents. In addition, increased program utilization was dependent on several factors, such as equipment, space, time, and overall program quality [27, 28]. However, further examination of the relationship between awareness and implementation is required.

Many factors have been reported in previous studies on the implementation of injury prevention programs. How to implement, duration of implementation, and program quality were usually the areas of focus. Regarding the duration of the program, the efficiency of time when using this prevention program, as confirmed by McKay *et al.* [28], was an essential factor in implementing any program for coaches who had not previously intended to do. Those who were aware of the program believed that program interventions take time [11]. However, the coaches who implemented the FIFA 11+ program made judgments based on the special experience of practical applications [29]. Lack of knowledge about proper implementation has been reported to be one of the major obstacles to adopting an injury prevention program. Therefore, the methods and contents of the program strategies should be modified according to the educational background of the coaches [28].

The effectiveness ratings were a highly motivating factor for coaches who implemented the FIFA 11+ program [29]. Perceived effectiveness and accessibility of the interventions were identified as potential facilitators of implementation; however, only 48.8% of our sample showed awareness, possibly because of a lack of information or misinformation about the efficacy and accessibility of the program. Many studies have found that the motivation of trainers who encourage the implementation of injury prevention programs appears to be associated with the players’ acceptance of such programs [17, 30]. Therefore, enhancing the coaches’ education about the effectiveness of the FIFA 11+ program is

essential for increasing awareness and implementation. However, a study by Saunders *et al.* [29] showed that few soccer clubs were aware of injury risks or prevention protocols; likewise, most coaches felt that soccer leagues did not adequately discuss injury prevention interventions. However, the FIFA 11+ Injury Prevention Program was launched in 2006, so it is relatively new with very few references available [30]; this might also be a factor contributing to the low level of awareness and implementation of the program globally.

## CONCLUSION

The results indicated a lack of awareness of the FIFA 11+ Injury Prevention Program among professional and semi-professional players and coaches globally. The players and coaches who implemented the program reported high positive perceptions regarding its ability to reduce the risk of injury. Therefore, football federations around the world should focus on increasing education about this program among players and coaches to reduce the risks of injuries and subsequent consequences that could affect both players and clubs.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was reviewed and approved by the Biomedical Ethics Committee at Umm Al Qura University (approval number: HAPO02K012202010458).

## HUMAN AND ANIMAL RIGHTS

No animals were used for this research. All human research procedures were followed in accordance to the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

## CONSENT FOR PUBLICATION

Consent was obtained from each participant before starting the data collection process.

## AVAILABILITY OF DATA AND MATERIALS

The data sets used during the current study can be provided from the corresponding author [N.A.] upon reasonable request.

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None.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest, financial or otherwise.

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