ORIGINAL ARTICLE

Knowledge, attitude, and practice of injury prevention exercise programmes and the FIFA 11+ among Malaysian elite soccer league coaches

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ABSTRACT

Background: A number of injury prevention programmes have been introduced in soccer. However, the familiarity and utility of these programmes by coaches in Malaysia is yet to be determined. Aim and Objectives: This study aimed to record the knowledge, attitude and practice of injury prevention exercise programmes (IPEPs), specifically the FIFA 11+, amongst coaches of elite league teams in Malaysia.

Materials and Methods: Active coaches from four elite soccer leagues (Super League, Premier League, President's Cup and Youth Cup) in Malaysia were invited to participate. Thirty-three (n = 33) responses were returned.

Results: Most respondents (87.9%) agree that soccer players are at high risk of lower-limb injury, and that it could have adverse effects on teams' and players' performances, careers and quality of life. More than two-thirds (71.9%) of respondents were optimistic about lower-limb soccer injury prophylaxis, however, familiarity toward the FIFA 11+ was considerably low, thus its practice is relatively low. Most respondents familiar to the programme believe that improvements could be introduced to suit their teams better or develop an own version of the FIFA 11+ specifically tailored for their teams. Having the need for equipment and lack of supervision may hinder IPEP maintenance in a team.

Conclusion: Injury prevention programmes need early implementation and progressive variation for ongoing practice. Clearly, no IPEP may serve as the perfect 'one-programme-fits-all' injury prevention measure. This study may provide some insight for practitioners and soccer club organizers to develop future IPEPs and exercise better programme delivery amongst professional soccer teams.

Key Words: Attitude, FIFA 11+, injury prevention, knowledge, soccer

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INTRODUCTION

Lower-limb injuries in soccer have drawn numerous efforts for prophylactic measures by researchers around the world. Injury prevention exercise programmes (IPEPs) such as HarmoKnee (Shojaei et al., 2011), Knaekontroll (Waldén et al., 2012), Sportsmetrics™ (Hewett et al., 1996; Noyes et al., 2011), PEP (Gilchrist et al., 2008; Mandelbaum et al., 2005) and the extensively promoted FIFA 11+ (Owoeye et al., 2014; Silvers-Granelli et al.,

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2015; Soligard et al., 2008) have resulted from extensive research and large-scale trials on exercises to counteract lower-limb injury mechanisms in soccer. These IPEPs, although proven in efficacy through randomized controlled trial studies, have unfortunately faced challenges against their implementation in elite soccer (O'Brien and Finch, 2016; 2017).

There are very few publications available regarding the implementation of IPEPs. IPEP implementation could range between 20% and 85% of female teams across varying competition levels (Emery and Meeuwisse, 2010; Emery et al., 2007; Hewett et al., 2006; Joy et al., 2013; Kiani et al., 2010; Lindblom et al., 2014). Fewer studies of the kind were conducted amongst male soccer teams. Zech and Wellmann (2017) noted that athletes believe that injury prevention is very important, reporting that 80% of athletes believe to be adequately informed about injury prevention, however, ironically 90% of the athletes resorted to exercises that have no evidence of preventing injury prior to matches or training sessions. Studies by O'Brien and Finch in 2016 and 2017 reported that only 2%–6% of their study respondents fully adopted the FIFA 11+, while another 10%–22% practice a modified version of the IPEP.

The low implementation of IPEPs amongst male soccer teams is indeed worrying. The compliance of athletes, coaches and practitioners play a crucial role for effective implementation of injury prevention strategies in sports practice (Soligard et al., 2008; Van Tiggelen et al., 2008). Soligard et al. (2010) demonstrated that better-compliant teams have lower injury rates compared to less-compliant teams. Hence, it draws a lot of concern when numerous studies have reported poor compliance with IPEPs amongst soccer teams.

To improve compliance amongst teams towards IPEPs, emphasis on understanding end-users' knowledge, attitude and practice of IPEPs should be considered a priority (Zech and Wellmann, 2017). This follows the sequence for injury prevention by Van Tiggelen et al. (2008), which was an extension of the theoretical framework of injury prevention proposed by van Mechelen et al. (1992), proposing that successful practice of injury prevention should include modification of attitude and behaviour towards injury risk factors and their prophylactic measures amongst its practitioners. Furthermore, identification of the factors that may influence the effectiveness of IPEP implementation may provide crucial information toward the betterment of its chances for success.

This study aimed to record the knowledge, attitude and practice of IPEPs, specifically the FIFA 11+, amongst coaches of elite league teams in Malaysia, as programme deliverers for their respective teams. Being the most extensively promoted IPEP for amateur and recreational soccer, the FIFA 11+ was selected as an outline for analyses of IPEPs in this study as there has not been an industry-grade IPEP for elite soccer. Another goal of this study was also to identify the facilitators and barriers to the maintenance of an IPEP in a team.

METHODS

Participants

Active coaches from four elite soccer leagues (Super League, Premier League, President's Cup and Youth Cup) in Malaysia were invited to participate.

Web-based survey

Coaches responded anonymously during mid-season break as the survey was distributed online via the Google Forms (Google, California, USA) platform. The survey was preceded by a statement on the title page providing information such as the study's purpose and the confidentiality of their responses. A response submission was regarded as a declaration of informed consent by respondents. The survey was adopted from O'Brien and Finch (2017), which probed into the coaches' knowledge, attitude, perceptions and practice of IPEPs, specifically the FIFA 11+. The survey consisted of three main sections: (a) respondents' perceptions of lower-limb injury susceptibility, injury seriousness and IPEPs; (b) respondents' awareness, use and perceptions of the FIFA 11+ programme and (c) respondents' perceived facilitators and barriers to IPEP maintenance.

Data analyses

Demographic data were evaluated using descriptive statistics. Scale data were reported as mean ± standard deviation, whereas nominal or ordinal data were presented as the percentages of answer categories (%) using SPSS version 28.0 for Windows (IBM, Chicago, Illinois, USA). Non-responders were excluded from the sample size (n) of a question.

RESULTS

Participants

Thirty-three (n = 33) responses were returned from 66 invited coaches (response rate = 50%). Of the 33 respondents, there were 20 coaches and 13 fitness coaches. In terms of league participation, 33.3% were from the Super League, the Premier League formed 12.1% of the responses, while the President's Cup and Youth Cup teams made 30.3% and 24.2% of responses, respectively.

Perceptions on injury susceptibility and seriousness

Most respondents agree that soccer players are at high risk of lower-limb injury (87.9%), and that it could have adverse effects on teams' and players' performances, careers and quality of life [Table 1].

Perceptions on injury prevention exercise programmes and injury prevention responsibility

More than two-thirds (71.9%) of respondents were optimistic about lower-limb soccer injury prophylaxis [Table 1]. The most perceived practice for injury prevention was controlled jumping and landing (90.9%), followed by balance exercises (87.9%), eccentric muscle strengthening (84.8%) and warm-up runs (66.7%). Cutting or sharp turning exercise was the least perceived practice for injury prevention (45.5%).

Table 1. Respondents' perceptions on lower-limb soccer injury susceptibility, seriousness and prevention programmes

	n	Agree			Neither agree nor disagree			Disagree		
		Percentage	95.0% CL		Percentage	95.0% CL		Percentage	95.0% CL	
			Lower (%)	Upper (%)		Lower (%)	Upper (%)		Lower (%)	Upper (%)
Soccer players are at high risk of suffering a LL injury	33	87.9	73.7	95.8	6.1	1.3	18.1	6.1	1.3	18.1
LL injuries can shorten a professional soccer player's career	33	66.7	49.7	80.8	30.3	16.8	47.1	3.0	0.3	13.3
LL soccer injuries can cause physical problems later in life	33	59.4	42.2	75.0	31.3	17.3	48.4	9.4	2.7	23.0
LL injuries have a negative impact on team performance	33	69.7	52.9	83.2	24.2	12.2	40.6	6.1	1.3	18.1
LL injuries have a negative impact on a soccer player's quality of life	33	57.6	40.7	73.2	27.3	14.4	43.9	15.2	6.0	30.1
It is possible to prevent some LL soccer injuries	33	71.9	54.9	85.1	25.0	12.6	41.7	3.1	0.3	13.7
Exercises which have been scientifically proven to prevent LL injuries should be performed by soccer players	33	84.8	69.9	94.0	12.1	4.2	26.3	3.0	0.3	13.3
Exercises to prevent injuries should be varied and progressed over time	33	75.8	59.4	87.8	21.2	10.0	37.2	3.0	0.3	13.3
Exercises which have been scientifically proven to prevent LL injuries should be incorporated into the club's training guidelines	33	81.8	66.3	92.0	15.2	6.0	30.1	3.0	0.3	13.3
Balance exercises can prevent LL injuries	33	87.9	73.7	95.8	9.1	2.6	22.3	3.0	0.3	13.3
Controlled jumping/landing can prevent LL injuries	33	90.9	77.7	97.4	3.0	0.3	13.3	6.1	1.3	18.1
Eccentric muscle strengthening can prevent LL injuries	33	84.8	69.9	94.0	12.1	4.2	26.3	3.0	0.3	13.3
A warm-up jog/run can prevent LL injuries	33	66.7	49.7	80.8	27.3	14.4	43.9	6.1	1.3	18.1
Cutting/sharp turning exercises can prevent LL injuries	33	45.5	29.4	62.2	39.4	24.2	56.4	15.2	6.0	30.1
Cool-down jog/run can prevent LL injuries	33	63.6	46.6	78.4	24.2	12.2	40.6	12.1	4.2	26.3

LL: Lower limb, CL: Confidence Level

When inquired about when exercises to prevent lower-limb injuries should be performed, 81.8% of respondents that they should be implemented both as part of the training, and as its own, separate training session. With regard to duration, 54.5% of respondents indicated that 15 min would be appropriate to perform injury prevention exercises. This was followed by 20 min (22.7%), 25 min (13.6%) and 10 min (9.1%).

Fitness coaches were deemed to be the most responsible in injury prevention (95.5%) and were followed by players (81.8%) and physiotherapists (77.3%). When asked regarding who bears the ultimate responsibility in injury prevention, 50% of respondents agree that the fitness coaches are responsible, followed by the players (18.2%), coaches (13.6%) and physiotherapists (13.6%).

Perceptions on the practice of the FIFA 11+

Familiarity towards the FIFA 11+ was only at 48.5% prior to the survey (n = 16). 81.3% of respondents familiar to the FIFA 11+ claim to currently use the programme in their team. Respondents familiar to the programme believe that improvements could be introduced to suit their teams better (100%) or develop an own version of the FIFA 11+ specifically tailored for their teams (56.3%) [Table 2].

More than 80% of respondents believed that the FIFA 11+ had prophylactic effects against lower-limb injuries to their team, and 56.3% of respondents agreed that the programme was soccer specific. The FIFA 11+ programme was considered too long by 25% of respondents. Half of the respondents agreed that it contains adequate variation and progression. Only 31.3% believed that the FIFA 11+ was sustainable for multiple seasons [Table 3].

Facilitators and barriers to injury prevention exercise programme maintenance

Respondents equally believed that an IPEP needed to contain the elements of progression and variation (81.8%) to be successfully maintained over multiple seasons in a team. This was followed by the knowledge and experience of the head coach and early implementation at the start of the season (78.8%), continuity in methodology, attitude, and ambition (75.8%) in the hierarchy of most perceived facilitators for IPEP maintenance.

Seventy-five per cent (75.8%) of respondents believe that the need for equipment could hinder the consistency of IPEP practice. Whereas almost two-thirds of respondents (63.6%) said that IPEPs "lack adequate supervision from administrators at various levels" and that "lack of knowledge, communication, and teamwork" leads to poor sustainability of the IPEP in the team [Figure 1].

DISCUSSION

Key findings

This study assessed the knowledge, attitude and practice of IPEP amongst elite soccer coaches in Malaysia. Coaches acknowledge the risks and seriousness of injuries on players' and teams' performances, careers and quality of life. Familiarity towards the FIFA 11+ was considerably low, thus its practice is relatively low. Most respondents familiar to the FIFA 11+ agreed that the programme can contribute towards injury prophylaxis, but less than a third of respondents were convinced about the programme's sustainability over multiple seasons. Similar findings were reported by O'Brien and Finch (2017), however, greater confidence was observed amongst respondents in a prior study (O'Brien and Finch, 2016). Perhaps, the inclusion of other staffers (i.e. physiotherapists and team doctors) from the survey conducted by O'Brien and Finch (2016) could explain the discrepancy in observations. This could imply that the promotion of the FIFA 11+ might have lesser reach in Malaysian soccer, thus highlighting a need for improved athlete education on injury and prevention measures.

This study also found that the implementation of IPEPs is relevant to teams as over 80% of respondents agree that evidence-based injury prophylaxis exercises should be performed by players and incorporated as club training guidelines. The high support for IPEPs observed in this study was consistent with observations from previous surveys conducted by O'Brien and Finch (2017), O'Brien and Finch (2016), McCall et al. (2015) and McCall et al. (2014). A study by Zech and Wellmann (2017) revealed that most players believe that they are adequately informed about injury prevention, however, their observation also noted that 91% of their survey respondents practiced measures inconsistent with scientific evidence for injury prevention prior to training or match play. Perhaps, with the incorporation of IPEPs into team or club policies, scientifically proven exercises for injury prevention could have added value to the athletes as well as the team's performance.

More respondents were either neutral or in favour for adaptations or modifications of the FIFA 11+ to suit their team. While more than 60% of respondents agree that proper warm-up and cool-down runs, balance, controlled jumping and landing as well as eccentric exercises could prevent lower-limb injuries in soccer, the implementation of such exercises might not be feasible to fit every training session throughout all seasons. Perhaps, several considerations may be needed regarding numerous variables such as equipment cost and availability, spatial requirements, session duration, human resource and even the athletes' individual needs. These variables were amongst the barriers to IPEP maintenance in this study and have also been reported in previous studies (O'Brien and Finch, 2016; O'Brien and Finch, 2017). Clearly, no IPEP may serve as the perfect 'one-programme-fits-all' injury prevention measure. Thus, coaches may need to consider selecting an IPEP such as the FIFA 11+ and using it as a blueprint for constructing several sets of simpler, more flexible programmes that may be feasible and adjustable to different scenarios revolving around their team's training.

Modifications and adaptations of IPEPs could also present additional benefits that could facilitate the maintenance of IPEPs across multiple seasons. In this study, more respondents were undecided on whether the FIFA 11+ is too long compared to those

Table 2. Respondents' knowledge and practice of the FIFA 11+ programme

	n	Yes			No			Unsure		
		Percentage	95.0% CL		Percentage	95.0% CL		Percentage	95.0% CL	
			Lower (%)	Upper (%)		Lower (%)	Upper (%)		Lower (%)	Upper (%)
Had you heard of the FIFA 11+ injury prevention programme before taking part in this questionnaire?	33	48.5	32.2	65.1	30.3	16.8	47.1	21.2	10.0	37.2
Does your team currently use the FIFA 11+ injury prevention programme?	16	81.3	57.9	94.4	0			18.8	5.6	42.1
Have you ever been in a team which used the FIFA 11+ injury prevention programme?	16	87.5	65.6	97.3	6.3	0.7	25.7	6.3	0.7	25.7
Does the FIFA 11+ injury prevention programme need to be improved for use in your team?	16	100.0			0			0		
Should your club develop its own version of the FIFA 11+ injury prevention programme?	16	56.3	32.6	77.8	6.3	0.7	25.7	37.5	17.4	61.7

FIFA: Fédération Internationale de Football Association, CL: Confidence Level

Table 3. Respondents' perception of the FIFA 11+ programme

	n	Agree			Neither agree nor Disagree			Disagree		
		Percentage	95.0% CL		Percentage	95.0% CL		Percentage	95.0% CL	
			Lower (%)	Upper (%)		Lower (%)	Upper (%)		Lower (%)	Upper (%)
The FIFA 11+ injury prevention programme can prevent LL injuries in your team	16	81.3	57.9	94.4	18.8	5.6	42.1	0		
The FIFA 11+ injury prevention programme is soccer specific	16	56.3	32.6	77.8	37.5	17.4	61.7	6.3	0.7	25.7
The FIFA 11+ injury prevention programme is too long	16	25.0	9.1	49.1	43.8	22.2	67.4	31.3	13.1	55.6
The FIFA 11+ injury prevention programme contains adequate variation and progression for our team	16	50.0	27.2	72.8	50.0	27.2	72.8	0		
The FIFA 11+ injury prevention programme could be maintained over multiple seasons by our team	16	31.3	13.1	55.6	31.3	13.1	55.6	37.5	17.4	61.7

FIFA: Fédération Internationale de Football Association, CL: Confidence Level

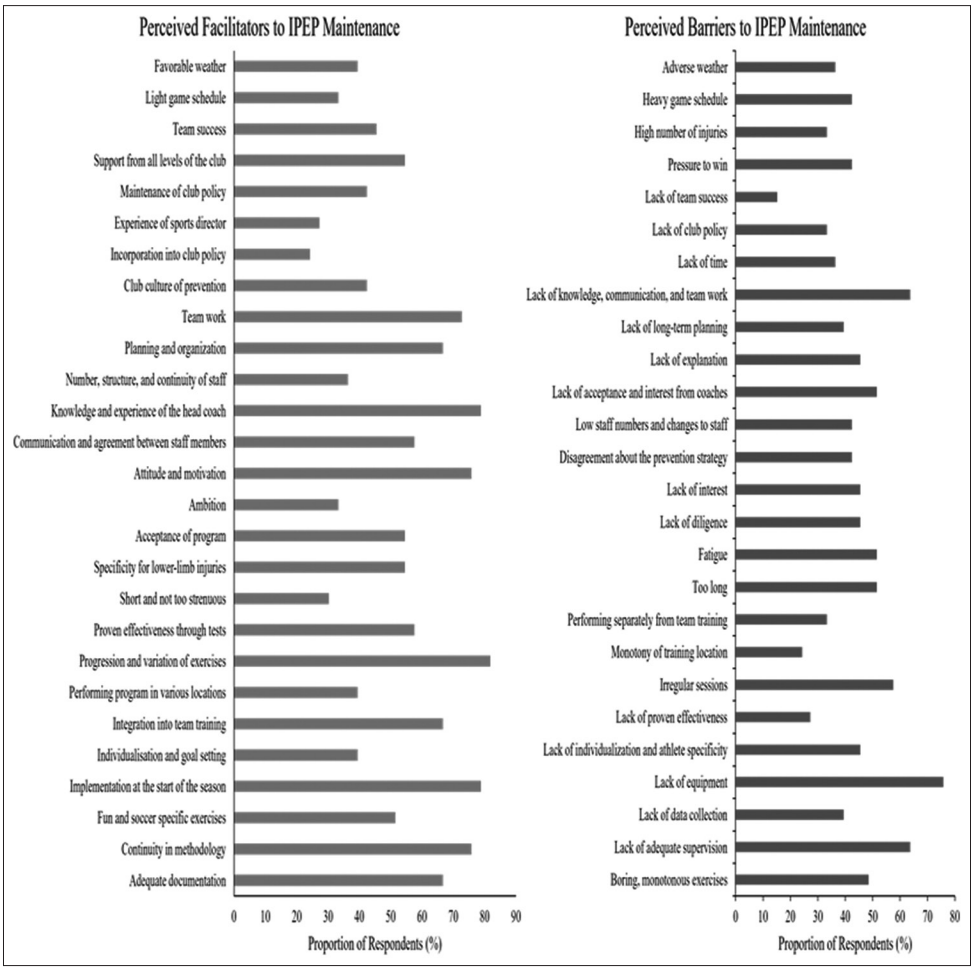

Figure 1: Facilitators and barriers to IPEP maintenance, IPEP: Injury prevention exercise programme

who disagreed, and half of the respondents were not convinced that the programme contains adequate variation and progression for their team. This study also found that progression and variation of exercises was the highest perceived facilitator to IPEP maintenance, however, the need for equipment and supervision may hinder its practice. This may imply that injury prevention practices should be enforced and maintained at the policy level of soccer organizing bodies (e.g. FIFA and Football Association of Malaysia) as well as at the club level. This also justifies the relevance of modifying and adapting IPEPs to suit teams' needs and means as coaches could also produce shorter, and more targeted exercise sessions that could be better implemented or incorporated into the teams' training schedules.

Limitations

The study included the following limitations: These limitations should be acknowledged and considered with caution for interpreting the findings of this study. The sample size in this study was small. Although reports of the responses were accompanied with 95% confidence intervals, generalizing the findings of this study should be done with caution. However, it should also be noted that reports of small sample sizes in surveys involving elite soccer athletes are common as access to elite teams may be challenging (McCall et al., 2014; McCall et al., 2015; O'Brien and Finch, 2016; O'Brien and Finch, 2017; Poulos et al., 2014). Furthermore, the survey items used in this study were adopted from O'Brien and Finch (2017) which were not subjected to any reliability and validity testing beyond face validity. Finally, this study emphasized on respondents' knowledge, attitude and behavior towards IPEPs. However, other confounding parameters that may influence their responses such as experience in soccer, injury background age and education level were not addressed in this survey.

CONCLUSION

There is high support for the implementation of IPEPs in elite soccer competition levels amongst coaches. Implementation of IPEPs should be considered at the policy level of soccer clubs and organizing bodies to enhance supervision and consistency in implementation. Most respondents believe that IPEPs may need customising to enhance their impact, thus detailed understanding of the teams' needs and training methods. Therefore, this study may provide some insight for practitioners and soccer club organizers to develop future IPEPs and exercise better programme delivery amongst professional soccer teams.

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Conflicts of interest

There are no conflicts of interest.

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