





# Injury and illness prevention practices in Qatar's professional football clubs – implementation of the IP<sup>2</sup> NetWork

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## ABSTRACT

**Background** The Aspetar Sports Injury and Illness Prevention Programme introduced the Aspetar IP<sup>2</sup> NetWork, a customizable injury prevention programme for professional football clubs in Qatar during the 2020/2021 season. It includes 23 focus areas selected by stakeholders to prevent sports-related health issues.

**Objective** To assess the real world implementation of the IP<sup>2</sup> NetWork preventive focus areas during the first season after introduction, focusing on team adoption and player compliance.

**Methods** A survey was conducted among team physicians, physiotherapists and fitness coaches from the 18 professional football clubs in Qatar. The survey examined the implementation of the IP<sup>2</sup> NetWork focus areas and the roles of the different professionals in managing these areas.

**Results** 17 out of 18 clubs reported using IP<sup>2</sup> focus areas, applying an average of 11.4 areas (range 4–21). The most commonly used strategies were the Nordic hamstring exercise, cold water immersion, taping and concussion prevention. Team physicians led 38% of the focus areas, followed by physiotherapists (25%) and fitness coaches (24%), with 11% managed collaboratively. Fitness coaches primarily handled exercise-based areas like warm-ups and load monitoring. Preventive measures were applied to the full squad in 81% of cases, with 19% targeting at-risk players. Player compliance was high, with 86% of focus areas adopted by all or most players, rising to 97% for players identified to be at greater risk of injury or illness.

**Conclusion** Implementing the IP<sup>2</sup> focus areas was widespread among teams in Qatar, with strong collaboration between medical staff. Player compliance, especially among at-risk players, was excellent, demonstrating the programme's feasibility and effectiveness in real-world settings.

## INTRODUCTION

Participation in professional sports offers numerous benefits, but the rigorous training regimens and high-intensity competition intrinsic to professional sports present a significant challenge to athletes, driving a weighty risk of injuries and illnesses.<sup>1</sup> These health concerns can adversely impact careers

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Preventive programmes aimed at reducing injuries in professional sports have shown promising results, but their uptake remains limited. Many of these programmes focus predominantly on exercise-based interventions without addressing broader factors contributing to athlete health.

## WHAT THIS STUDY ADDS

⇒ Our results suggest that the collaborative approach of Aspetar IP<sup>2</sup> NetWork supports high adoption rates and compliance in professional football, particularly when the programme is tailored to individual athletes. The study also highlights the critical role of both fitness coaches and medical staff in successfully implementing preventive strategies.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study highlights the importance of combining collaborative and individualised injury prevention strategies to enhance future programme designs in professional football, leading to more effective and sustainable practices. This approach could potentially be adapted to recreational, semiprofessional and other sports as well by tailoring resources and strategies to meet the specific needs of these groups.

and performance, perturbing team success, league standings and financial stability through lost playing time and deflated fan engagement.<sup>1–5</sup> Professional football exemplifies this challenge. Studies report a costly burden of injuries among professional footballers, including muscle strains, ligament sprains and overuse injuries.<sup>6</sup>

Implementing mitigation strategies can prevent a substantial portion of football-related injuries and illnesses in players.<sup>7</sup> However, professional football presents unique challenges for injury prevention due to its high-intensity demands, frequent matches and limited recovery times. The commonly studied preventive strategies

encompass a wide range of interventions, such as targeted exercise programmes, appropriate equipment use, load management and effective return-to-play protocols.<sup>8–11</sup> Studies have demonstrated that adopting such evidence-based practices can significantly reduce injury rates and improve overall athlete health outcomes,<sup>12–13</sup> however, the preventive effect of some of these studies has been debated.<sup>14</sup> Implizzini *et al* concluded that the recommendation can be made only for football.<sup>14</sup> It is crucial to note that only strategies that are adopted in practice by stakeholders (players, coaches and sporting bodies) will prevent injuries.<sup>15</sup> A critical challenge remains, ensuring the successful translation from research to real-world application. Despite the documented effectiveness of injury and illness programmes, their uptake in the professional football setting is still not encouraging.<sup>16–17</sup>

Tailored, comprehensive and collaborative programmes that incorporate the practical considerations of individual athlete risks based on risk management models<sup>18–20</sup> and the perspectives of coaches and sporting bodies are more likely to be embraced and implemented effectively. This should ultimately lead to a reduction in sports-related injuries and illnesses within professional football.<sup>21</sup> Building on this concept, we developed the Aspetar IP<sup>2</sup> (Injury and Illness Prevention for Performance) NetWork as a unique, stakeholder-driven programme built on a collaborative framework. The IP<sup>2</sup> NetWork incorporates 23 focus areas, each supported by scientific evidence and established through a consultative process involving medical staff from professional Qatari football leagues and scientific experts. This approach ensures the programme is not only grounded in science but also addresses the specific needs and challenges faced by athletes, coaches and football bodies in Qatar.<sup>22</sup> Following the programme's launch in the 2020/2021 season for all professional football clubs in Qatar, we aimed to identify which of the 23 IP<sup>2</sup> preventive focus areas were being used and also their level of adoption and implementation during the first season after the completion and introduction of the final programme.

## METHODS

### Study design

This survey-based cross-sectional study was a collaborative effort involving team doctors, physiotherapists and fitness coaches from Qatar's professional football clubs conducted before the 2022–2023 season.

### Setting

In 2015, Aspetar Orthopaedic and Sports Medicine Hospital in Doha, Qatar, launched regular workshops under the Aspetar Sports Injury and Illness Prevention Programme (ASPREV). These workshops are aimed at employing risk management principles for injury and illness prevention, engaging team physicians and team physiotherapists from the National Sports Medicine Programme (NSMP). Over time, participation expanded to include club fitness coaches, enhancing the discussions

and outcomes. In 2020, this collaborative effort led to the creation of the new multimodal injury and illness prevention programme, the IP<sup>2</sup> NetWork. In 2021, this programme was officially introduced to all football clubs in Qatar.<sup>22</sup>

On 25th August 2022, a survey was conducted in all 18 professional football clubs attending the joint NSMP–ASPREV workshop before the 2021–2022 season. We asked all staff from each team to review and answer the questions together, providing one answer on behalf of their club. They were given 15 min to discuss and complete the survey based on their injury and illness prevention practices during the previous season after the introduction of the IP<sup>2</sup> NetWork.

### The Aspetar IP<sup>2</sup> NetWork

The IP<sup>2</sup> NetWork addresses a range of injury and illness prevention areas beyond preventive exercise programmes. It consists of 23 focus areas (figure 1), selected and prioritised based on the needs identified by medical and technical teams in Qatar's professional football setting. This programme resulted from a structured process of team risk identification, assessment and prioritisation involving injury and illness prevention stakeholders.<sup>22</sup>

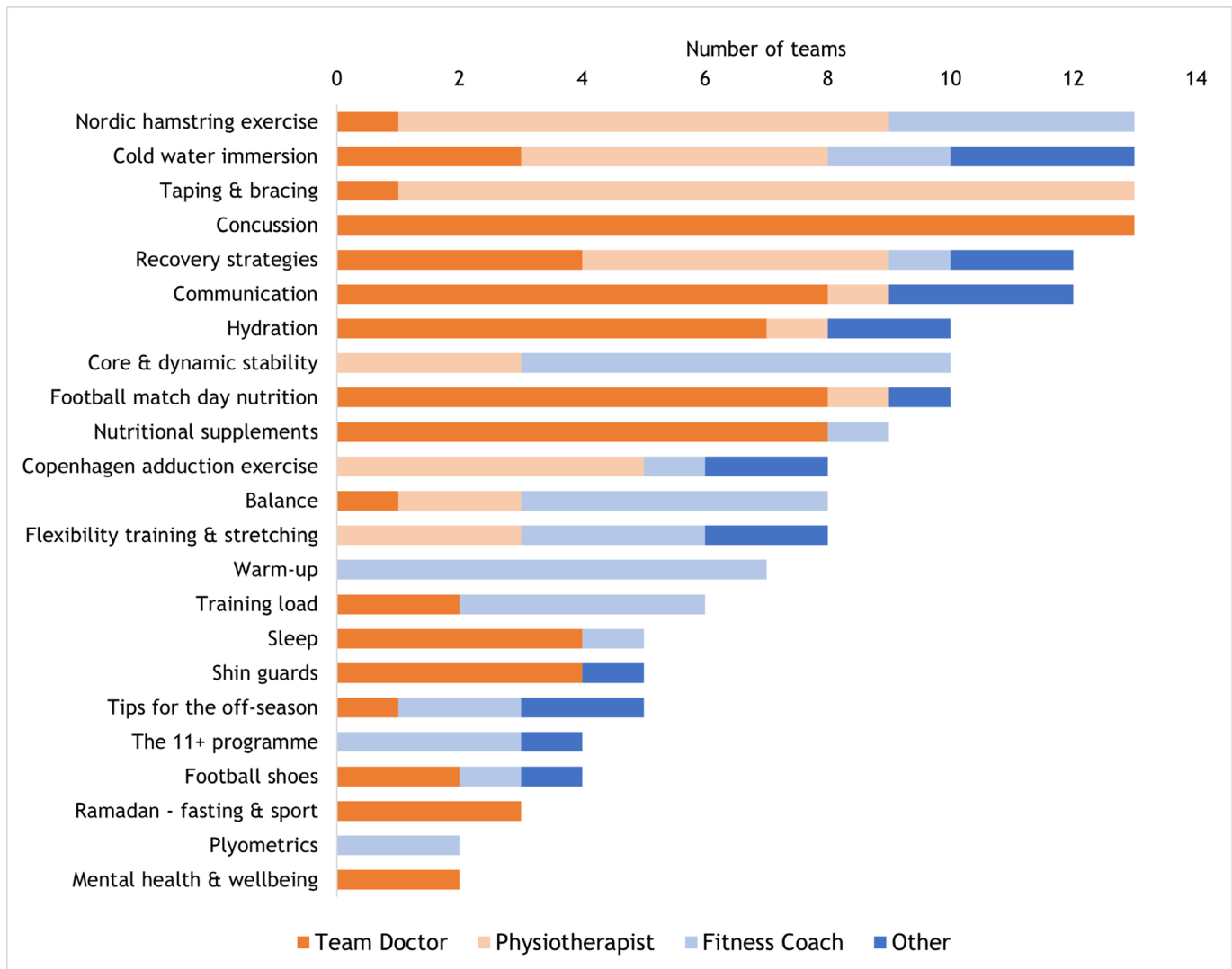
### Participants

The medical team (team physician and physiotherapist) and fitness coaches (if present) from all professional football clubs playing in the Qatar Star League and Qatar's second tier league, involved in creating the IP<sup>2</sup> NetWork, were invited to participate in this study.

### Survey

All participants were invited to complete an online, non-anonymised survey. The survey was introduced through a QR (Quick Response) code and aimed at determining if clubs had implemented the Aspetar IP<sup>2</sup> NetWork programme in their daily practice by asking 'Did you implement any prevention strategy based on the Aspetar IP<sup>2</sup> network booklet provided to you by email in 2021 during the 2021–2022 season?'. If they had, the survey further sought to identify (1) the main focus areas addressed, (2) the primary person responsible for implementing each focus area and (3) the level of implementation during the season.

The survey (online supplemental material) was developed by the research team and consisted of five main questions: three identification questions and two questions on injury and illness prevention practices. Depending on the focus areas selected, the clubs were asked to answer two additional questions to identify the implementation lead and the level of implementation. Most questions were yes–no, except for the communication focus area, where teams were required to describe their main practices. The survey was piloted with medical staff and technical staff of one football club, prior to its introduction at the workshop.



**Figure 1** Distribution of IP<sup>2</sup> NetWork (Injury and Illness Prevention for Performance) preventive focus areas implemented, as well as the distribution of the implementation lead during the 2021–2022 season.

### Statistical analysis

Descriptive data are presented as counts and proportions.

### Patient and public involvement statement

No patients or members of the public were involved in the planning, design, data collection, analysis or interpretation of this study's results.

### Equity, diversity and inclusion statement

The study focused solely on male professional players in Qatar, a diverse group from all over the world, and involved their support staff, predominantly males recruited from North Africa, Asia and Europe.

## RESULTS

All 18 teams completed the survey; 17 reported that a combination of IP<sup>2</sup> preventative strategies was implemented in their clubs, while one team reported not using any preventive focus areas based on IP<sup>2</sup> but using other strategies. Teams reported implementing an average of

11.4 preventive focus areas during the season, with four as the minimum and 21 as the maximum. [Figure 1](#) depicts the distribution of strategies employed, with the Nordic hamstring exercise, cold water immersion, taping and bracing and concussion prevention as the most frequent focus areas ([figure 1](#)).

Team physicians reported themselves as the most frequent implementation lead within their respective teams, being the main person in charge and responsible for 38% of the focus areas implemented. They were followed by physiotherapists (25%), fitness coaches (24%) and 'working as a group' (11%, ie, either the whole medical team or a medical team member and fitness coach working together). Fitness coaches were mainly responsible for implementing exercise-based preventive focus areas like warm-up (fitness coaches implemented 100% of warm-up programmes), the 11+ programme, core and dynamic stability, training load monitoring and balance training ([figure 1](#)).

**Table 1** Level of team implementation and player adoption for the IP<sup>2</sup> NetWork preventive focus areas during the 2021–2022 season (excluding communication)

Focus areas	Level of team implementation and player adoption (%)					
	Introduced to all players and adopted by:			Introduced to the players at risk and adopted by:		
	All	Majority	Few	All	Majority	Few
The Nordic hamstring exercise	30.8	38.5	7.7	–	23.1	–
Cold water immersion	38.5	30.8	15.4	–	15.4	–
Taping & bracing	15.4	38.5	–	15.4	23.1	7.7
Concussion	46.2	30.8	–	–	23.1	–
Recovery strategies						
Massage	33.3	58.3	–	8.3	–	–
Self-myofascial release	25.0	16.7	50.0	8.3	–	–
Stretching	33.3	58.3	–	8.3	–	–
Compression garments	25.0	16.7	50.0	8.3	–	–
Hydration	30.0	40.0	10.0	–	20.0	–
Core & dynamic stability	40.0	30.0	20.0	–	10.0	–
Nutrition for football – match day	20.0	40.0	10.0	–	30.0	–
Nutritional supplements	22.2	33.3	22.2	–	22.2	–
The Copenhagen adduction exercise	25.0	12.5	25.0	25.0	12.5	–
Balance	37.5	25.0	12.5	–	25.0	–
Flexibility training & stretching	37.5	37.5	25.0	–	–	–
Warm-up	57.1	14.3	14.3	14.3	–	–
Training load	16.7	33.3	16.7	16.7	16.7	–
Sleep	20.0	40.0	40.0	–	–	–
Shin guards	40.0	40.0	20.0	–	–	–
Tips for the off-season	–	80.0	–	–	20.0	–
The 11+ programme	–	75.0	25.0	–	–	–
Football shoes	50.0	–	25.0	–	25.0	–
Ramadan—fasting & sport	66.7	33.3	–	–	–	–
Plyometrics	50.0	50.0	–	–	–	–
Mental health & well-being	50.0	–	50.0	–	–	–

Most teams applied the focus area to the entire squad (81% of the situations where a preventive focus area was implemented); in 19% of situations, they only targeted players believed to be at risk of injury or illness based on medical evaluations, prior injury history or risk assessments conducted by the team's medical staff. In general, team physicians reported good adoption of the measures by players. Indeed, in 86% of the situations, either all

the players or the majority of players were reported to have adopted the preventive strategies introduced. When only players at risk were targeted, adoption (either by all players or the majority of players) increased to 97% (table 1). Analysing the adoption rate among players based on the role of the main person(s) in charge within the team, 'working as a group' resulted in a 100%

**Table 2** Level of team implementation and player adoption for the IP<sup>2</sup> NetWork based on the main person in charge during the 2021–2022 season (excluding communication)

The main person in charge	Level of team implementation and player adoption (%)					
	Introduced to all players and adopted by:			Introduced to the players at risk and adopted by:		
	All	Majority	Few	All	Majority	Few
Team doctor	37.9	28.8	13.6	–	19.7	–
Physiotherapist	26.1	37.0	15.2	6.5	13.0	2.2
Fitness coach	37.2	34.9	13.9	4.6	9.3	–
Working as a group	50.0	31.2	–	6.2	12.5	–

adoption rate, either by all or the majority of the players (table 2).

Teams described the communication focus area as their main strategy to implement. Out of 12 teams implementing communication, 10 teams stated in-person forms of discussions as regular meetings (team/individual/follow-up), workshops and face-to-face communication as their main strategy to improve the communication within the team for injury prevention, and two teams reported continuous exchange of medical status of players and providing updates on the injury/illness status as their main strategy.

## DISCUSSION

This study provides the first analysis of the real-world implementation and adoption of a multimodal injury and illness prevention programme (the Aspetar IP<sup>2</sup> NetWork) in the Qatar professional football setting. Our study reveals high adoption rates of injury prevention focus areas (86%) and even greater rates for individually implemented programmes (97%). These findings underscore the feasibility of implementing a multicomponent, evidence-based framework in the Qatari professional league, where the team staff cocreated the tailored programme. While research on injury prevention in professional football is limited, studies in youth football provide valuable insights on the importance of tailored injury prevention strategies.<sup>23 24</sup> Previous research has primarily focused on singular preventive strategies, such as exercise-based programmes,<sup>7</sup> neuromuscular training,<sup>25 26</sup> protective equipment<sup>27</sup> and nutrition/hydration strategies.<sup>28</sup> Our data highlight that professional football clubs apply a combination of preventive strategies and that both medical and technical team staff engage to implement these. However, in a systematic review and meta-analysis, Obertina *et al*<sup>29</sup> emphasised that the effectiveness of multicomponent exercise-based injury prevention programmes in football remains uncertain and inconclusive, largely due to low-quality evidence, underscoring the need for high-quality studies to evaluate their efficacy thoroughly.

In line with existing studies in football,<sup>30–33</sup> our findings also highlight the popularity of exercise-based preventive measures. The Nordic hamstring exercise was the most frequently reported focus area for injury prevention. The frequent use of the Nordic hamstring exercise in our study reflects its widespread adoption in professional football, reflecting its widely documented efficacy in reducing hamstring injuries.<sup>34 35</sup> However, its efficacy in reducing hamstring injuries has recently become a subject of debate, with a study questioning its effectiveness claiming high-risk study of bias;<sup>14</sup> in this updated meta-analysis, they also concluded that recommendation on the effectiveness of the Nordic hamstring exercise can only be made for football.<sup>14</sup> Unlike previous studies,<sup>7 23–26</sup> focusing on exercise-based prevention programmes, our study diverges by highlighting the importance of non-exercise-based focus areas. Teams reported to commonly

adopt a range of practices, such as cold-water immersion, taping and bracing and concussion management strategies. They also addressed a wider range of factors contributing to athlete health, like recovery strategies, hydration and mental health and well-being. Communication within the team also emerged as a critical component of the IP<sup>2</sup> NetWork, as the sixth most commonly reported focus area. This aligns with the findings by Tabben *et al*,<sup>36</sup> Horan *et al*<sup>37</sup> and Ekstrand *et al*,<sup>38</sup> who emphasised the role of effective communication in injury prevention.

Our data also highlight the crucial contribution of the entire team for implementing injury prevention strategies. While previous studies have emphasised the lead role of medical staff,<sup>5 38</sup> Bolling *et al* pointed to the salient contribution of the technical team.<sup>39</sup> We confirm that fitness coaches represent key figures, mainly responsible for the exercise-based components of the programmes: warm-up routines, the “FIFA 11+” (Fédération Internationale de Football Association) programme, core and dynamic stability exercises, training load monitoring and balance training. This highlights the collaborative nature of effective injury prevention and the need for an integrated medical and technical staff approach.<sup>36 40</sup>

Finally, the clubs reported that targeting focus areas to high-risk players increased the adoption rate to up to 97%, highlighting the benefits of individualised injury prevention strategies. Previous studies have also emphasised the need for individualised approaches and tailored injury prevention programmes.<sup>23 40</sup>

## Injury prevention practices in professional football

Questionnaire-based studies by McCall *et al*.<sup>30–33</sup> have documented the practices of professional club and national team medical staff, identifying common trends in the exercise programmes used.<sup>30–33</sup> In 2014, they surveyed premier league teams, mainly from Europe,<sup>30</sup> then national teams participating in the FIFA World Cup.<sup>31</sup> They extended their research to clubs in the UEFA (Union of European Football Associations) Elite Club study in 2015<sup>32</sup> and published a Delphi-style survey in 2020 involving 21 sports practitioners from 18 teams in the Big-5 European leagues, focusing on muscle injury prevention.<sup>33</sup>

Their initial survey<sup>30</sup> listed the most common exercises used to prevent non-contact injuries, ranked by their frequency: eccentric exercises, balance/proprioception, hamstring eccentric training, core stability, Nordic hamstring and gluteus activation exercises. The 2014 FIFA World Cup teams emphasised flexibility, core stability, combined contractions, balance and eccentric training.<sup>31</sup> In the UEFA Elite Club Injury Study,<sup>32</sup> the top preventive exercises reported were eccentric, balance/proprioception and core training. The Delphi survey<sup>33</sup> found that practitioners considered sprinting and high-speed running ‘very effective’ for preventing non-contact muscle injuries, eccentric exercises ‘effective’ and other exercises (concentric, plyometrics, isometric, activation/

coordination, dynamic flexibility, core stability and static flexibility) as 'somewhat effective'.

We show that preventive exercises, such as the Nordic hamstring exercise, core and dynamic stability, the Copenhagen adduction exercise, balance, flexibility training and stretching, warm-up and the FIFA 11+ programme, represented focus areas practised in the Qatari professional league. However, only Nordic hamstring training and core and dynamic stability exercises were implemented by more than half of the clubs. Limited adoption of evidence-based programmes like the Nordic hamstring exercise has also been documented in male professional football in Europe,<sup>16</sup> although improving more lately.<sup>41</sup> The widespread adoption of Nordic hamstring and dynamic stability exercises in our study could be attributed to their simplicity, requiring minimal equipment and resources, as well as their strong promotion in widely published scientific articles.<sup>16 34 35</sup> Furthermore, our study highlights that fitness coaches who are familiar with exercise-based interventions are often responsible for implementing these programmes, which could contribute to their prioritisation. Conversely, there is limited research on prevention strategies other than those based on exercise programmes.<sup>7 42</sup> Focus areas such as hydration strategies and mental health programmes were implemented less frequently. This may be due to logistical challenges, such as resource limitations or lower prioritisation by team staff. Additionally, these focus areas may require specialised training or infrastructure, which could act as barriers to their widespread adoption. Our data shed light on other preventive measures, such as cold-water immersion, taping and bracing, concussion management, recovery strategies, communication and match-day nutrition and hydration, which can lead to players' readiness, faster recovery and reduced fatigue.<sup>28 43</sup> The high level of compliance observed in these focus areas may reflect their perceived immediacy and importance in preparing players for peak performance. In the Qatari context, the climate and frequent match schedules likely also contribute to their prioritisation. Our data demonstrate that practitioners combine exercise-based interventions with other measures to keep their players healthy.

### Individualised implementation and adoption

While the importance of individualised, tailored approaches has been evaluated in youth football, there is a notable lack of research focusing on the implementation of individualised injury prevention programmes in professional football.<sup>23 24</sup> O'Brien *et al* examined the injury prevention practices in one European youth football academy,<sup>23 24</sup> reporting that teams employed a range of exercise programmes, developed by the team physical therapists and strength and conditioning coaches informed by the scientific literature, guidelines, individual player screening data and previous experience.<sup>23</sup> Across the four teams, 76% of individualised prevention exercise programme sessions were completed as originally

planned and a further 11% in modified form. The key barriers to implementation during the season were changes and managing player workload. Through observation of 160 full training sessions, they also compared the specific exercises used against the components of the 'industry-standard' FIFA 11+ programme.<sup>24</sup> Exercises were performed in the original form in 12% and in the modified form in 28% of sessions. Staff modified exercises to add variation, progression and individualisation, and to align with specific training formats and goals. Their data indicate that while professional youth soccer teams use exercises similar to FIFA 11+, they tailor them to suit their unique contexts.<sup>24</sup> This emphasises the importance of tailored approaches in injury prevention.

Our results match these findings, showing that applying a multicomponent, team-specific injury prevention programme can lead to an adoption rate as high as 86% and even 97% when the programmes are implemented individually for players deemed at specific risks. The high adoption rate, particularly when implemented individually, indicates that individualised, tailored programmes are beneficial. Basing the selection of components of the IP<sup>2</sup> NetWork on injury surveillance and health evaluation data may also be favourable.

### Teamwork is crucial

Our data underscore the crucial contributions of the entire team in the process. While the role of medical staff has been emphasised,<sup>5 38</sup> fitness coaches play a key role in managing the exercise-based components, affirming the collaborative nature of injury prevention. Corrigan *et al*<sup>44</sup> found that stakeholder communication is one of the key barriers to the success of injury prevention in ladies' Gaelic football, and they concluded that promoting team leadership and communication will facilitate the success of injury prevention.<sup>44</sup> Tabben *et al*<sup>86</sup> also highlighted that in the Qatari professional league, effective communication within the team was essential for the successful implementation of injury prevention strategies. Similarly, Horan *et al*<sup>87</sup> found that inadequate communication among players, head coaches and medical staff hindered using evidence-based injury prevention protocols in Irish women's football. Ekstrand *et al*<sup>88</sup> reported that effective internal communication within a team is associated with lower injury rates and higher training attendance and match availability. McCall *et al*<sup>82</sup> also identified poor internal communication as a major external risk factor for injuries among UEFA Elite Club teams.

Researchers have traditionally explored the opinions of medical staff on injury prevention implementation.<sup>30-33 45</sup> However, some studies also highlight the important role of coaches, considering them the main stakeholders.<sup>36 46 47</sup> Our findings align with these studies, affirming the collective nature of injury prevention implementation in the professional setting, emphasising the importance of communication among stakeholders and the sharing of responsibility between all team staff in these studies.

In addition, barriers related to injury prevention delivery agents, as identified by Corrigan *et al*<sup>44</sup> and Richmond *et al*,<sup>48</sup> underscore the importance of coach involvement. Coaches not only influence player education but also shape the implementation process as shown by Brown *et al*<sup>47</sup> who demonstrated the effectiveness of coach-led interventions in rugby.<sup>47</sup> Patterson *et al*<sup>49</sup> further reported that the cocreation of the injury prevention programme with coaches improved the adoption rates. This finding is consistent with our observation that collaborative approaches yield better compliance in professional football.<sup>49</sup>

### Strengths and limitations

While the study and its findings are specific to professional football clubs in Qatar, the structured approach to creating and introducing the Aspetar IP<sup>2</sup> NetWork and evaluating the implementation and adoption rate can be applied in non-professional football settings or other sports. Our study is unique in its approach as it does not merely evaluate injury prevention practices but rather assesses the implementation of a specific injury prevention programme cocreated by the teams. One of the key strengths of our study is the comprehensive approach involving multiple stakeholders, including both medical and technical staff who were considered the cocreators of the programme. This participatory approach enhances the internal validity of our findings, by integrating diverse perspectives, experiences and understandings from various stakeholders. Although we attempted to mitigate recall or social desirability bias by involving multiple stakeholders in the survey, the reliance on self-reported data remains a limitation. Our study also lacks detailed baseline data on the extent to which focus areas were used in clubs prior to the introduction of the IP<sup>2</sup> NetWork. While our evaluation focuses on adherence to the practical recommendations of the IP<sup>2</sup> NetWork, it is possible that some focus areas, such as the Nordic hamstring exercise, were already being implemented in varied forms that differed from the IP<sup>2</sup> NetWork's guidelines. Future research should incorporate longitudinal data to better understand the long-term impact of the IP<sup>2</sup> NetWork on injury and illness risk. Additionally, expanding the research to include other sports and settings will help validate the broader applicability of our findings.

### CONCLUSIONS

Our study demonstrates the feasibility and effectiveness of implementing the Aspetar IP<sup>2</sup> NetWork in professional football. High adoption rates of key focus areas and strong player compliance highlight the programme's potential to enhance injury prevention practices and the importance of involving multiple stakeholders and addressing a wide range of factors beyond exercise-based interventions. Our data also indicate that tailoring injury and illness prevention practices to each player's needs and challenges will increase the adoption rate. However

future research should address the scalability of these findings to other settings and explore strategies for broader implementation.

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