'More than likely the men come first. That's just very frustrating'. A qualitative exploration of contextual factors affecting the implementation of injury prevention initiatives and the provision of effective injury management in elite-level women's club football in Ireland

Dan Horan ,[1,2] Eamonn Delahunt ,[1] Mark Roe,[1] Martin Hägglund ,[3] Catherine Blake,[1] Seamus Kelly[1]

► Additional supplemental material is published online only. To view, please visit the journal online (http://dx.doi.org/10.1136/bjsports-2022-106548).

[1]School of Public Health, Physiotherapy and Sports Science, University College Dublin, Dublin, Leinster, Ireland
[2]Department of Sport, Leisure and Childhood Studies, Munster Technological University Cork, Cork, Ireland
[3]Department of Health, Medicine and Caring Sciences, Linköping University, Linköping, Sweden

Correspondence to
Dr Dan Horan, Department of Sport, Leisure and Childhood Studies, Munster Technological University Cork, Cork, Ireland; dan.horan@mtu.ie

Accepted 24 October 2023

To cite: Horan D, Delahunt E, Roe M, *et al*. *Br J Sports Med* Epub ahead of print: [*please include* Day Month Year]. doi:10.1136/bjsports-2022-106548

ABSTRACT

Objectives The aim of our study was to explore the contextual factors that affect the implementation of football injury prevention initiatives and the provision of effective injury management in the Irish Women's National League (WNL).

Methods We used a criterion-based purposive sampling approach to recruit coaches (n=7), players (n=17) and medical personnel (n=8) representing eight of the nine clubs in the WNL to participate in one-to-one semistructured interviews. Our study was located within an interpretivist, constructivist research paradigm. The interview data were analysed using reflexive thematic analysis.

Results The participants identified academic and work pressures, financial challenges, conflict with college football, inadequate facilities and gender inequity as being barriers to the implementation of injury prevention initiatives and the provision of effective injury management. Financial constraints within clubs were perceived to limit the provision of medical care and strength and conditioning (S&C) support and this was deemed to be associated with a heightened risk of injuries.

Conclusion Specific contextual factors were identified which curtail the implementation of injury prevention initiatives and the provision of effective injury management in elite-level women's club football in Ireland. Gender inequity was identified as one of the factors impacting the availability of high-quality medical care, S&C support, as well as access to training and match facilities. Our results provide new insights that could be used to inform the design and implementation of injury prevention and management initiatives for women football players in Ireland.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ The incidence rate and burden of injuries in elite-level women's club football is high.
⇒ There are marked variations in the quality of medical care, strength and conditioning (S&C) support and facilities available to elite-level women's club football players internationally.
⇒ Increased investment in women's football by governing bodies such as the Fédération Internationale de Football Association (FIFA) and the Union of European Football Associations (UEFA) has facilitated the provision of medical and sports science support.
⇒ There is a paucity of qualitative research which explores the contextual factors that influence the implementation of injury prevention initiatives and the provision of effective injury management in elite-level women's club football.

WHAT THIS STUDY ADDS

⇒ Academic and work pressures outside football negatively affect the time that players can devote to preparing for the demands of match play. These pressures also limit the time available to coaches and medical staff for the implementation of effective injury prevention initiatives and the provision of effective injury management in elite-level women's club football.
⇒ Financial limitations constrain the provision of optimal medical care and S&C support. A lack of availability of medical care was perceived by players, head coaches and medical personnel to be associated with an increased risk of injuries.
⇒ Inequitable access to training and match facilities, and medical care available to female players in comparison to their male peers is common in elite-level club football in Ireland.

INTRODUCTION

Injuries are an occupational hazard in elite-level women's football.[1 2] The contextual factors (eg, coaching personnel, medical personnel, facilities, fixture schedules, professional vs amateur playing status) that exist within leagues and clubs are likely to influence the prevalence, incidence rates and burden of injuries.[3 4] The medical care, strength and conditioning (S&C) support, as well as the training and match-day facilities available to elite-level female football players varies considerably

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ There is a responsibility for football governing bodies to require women's football leagues and club ownership to provide the financial supports needed to implement effective injury prevention strategies, medical care and S&C programmes.

⇒ Football club and academic partnerships are essential to facilitate the development of dual career athletes. This is because female players in many countries are likely to need to generate an income outside of professional football during their playing careers. Additionally, the vast majority of players will need to work in a different industry when their playing careers finish.

⇒ Football administrators should ensure that match congestion does not impact on players who are involved in college-level football and club-level national league football concurrently.

⇒ Governing bodies must implement policies that ensure gender equity regarding access to facilities, medical care and S&C expertise.

internationally.[5 6] Players and coaches need to be provided with the required levels of backroom (eg, medical, sports science, S&C, nutrition, psychology and performance analysis) and financial support to optimally perform their roles, while sports medicine teams need to work collaboratively, maintain clear lines of communication, and adopt innovative best practices.[7] Owoeye *et al*[8] outlined the role that systems-related, socioeconomic and demographic factors play in the successful implementation of injury prevention strategies in sports.

Barriers to protecting the health and welfare of women football players include, low levels of financial investment, poor quality training and match-day facilities, inadequate quality and quantity of staff (eg, coaches, physiotherapists and doctors), competition for resources with male teams and a lack of promotion of the game.[9–12] The 2022 Federation Internationale de Football Association (FIFA) Benchmarking Report on Women's Football highlighted that across the elite-level women's club teams surveyed in 30 top-tier nations, specialist expertise that is routinely available in elite-level men's club football, such as sports scientists and nutritionists were only available in 27% and 46% of the clubs, respectively.[13] This highlights the inequity in the expertise that elite-level women football players have access to, relative to their male counterparts. Seventy per cent of the clubs surveyed in the 2021 FIFA Benchmarking Report on Women's Football generated a financial loss suggesting that the majority of elite-level women's clubs may not currently be in a position to invest further in the provision of specialist expertise.[6]

The presport, training and competition environments that women football players are exposed to also need to be considered when analysing the barriers that impinge on their physical, technical and tactical development.[3] Football governing bodies such as FIFA and the Union of European Football Associations (UEFA) have acknowledged the need to address some of the challenges that exist in women's football, and have consequently developed specific women's football development programmes.[14 15] However, the effectiveness of these programmes in addressing the inequities that exist in women's football remains unclear.[14 15] Alongside its women's football development programme,[12] FIFA also introduced a club licencing guide in women's football in 2022 to support the 211 FIFA member associations when implementing club licencing regulations, including the minimum coaching and medical care standards currently required in 4 of the six football confederations.[16]

Despite these recommendations, Okholm Kryger *et al*[17] highlighted the current shortcomings in the evidence-base in elite-level women's football, including injury prevention and management. Arundale *et al*[18] also recommended that more research is required to explore the barriers to the implementation of anterior cruciate ligament (ACL) injury prevention strategies in women's football. This was an injury with the highest burden in a recent study in elite-level women's club football in Ireland.[1] To advance the shortcomings in the evidence-base regarding injuries in elite-level women's club football, we undertook a qualitative study, whereby we used insights from players, head coaches and medical personnel to identify the contextual factors influencing the implementation of injury prevention initiatives and the provision of effective injury management in the Women's National League (WNL) in Ireland.

METHODS

Study design

Our study was located within an interpretivist, constructivist research paradigm where knowledge is viewed as a coconstructed activity involving the researcher, the research participants and the collaborative research team.[19 20] Our motivation for adopting this methodological approach is for discovering meaning and understanding the participants' lived experiences in context.[1 2] To facilitate high-quality reporting, our study adheres to the COnsolidated criteria for REporting Qualitative research[21] (COREQ) (online supplemental file 1).

Participants

Following institutional ethical approval, all potential participants received an email from the Football Association of Ireland's (FAI) High Performance Director with information about the proposed study. Potentially interested participants contacted him expressing their interest in participating. He provided these participants with the primary researcher's (DH) contact details, and they contacted him. The participants received an introductory telephone call and an email from the primary researcher, that provided an initial overview of the study and an invitation to participate. They were also provided with the opportunity to contact the primary researcher at a future date prior to participation if they required any further information about the study. All participants provided verbal informed consent and received information concerning ethical and confidentiality considerations. In line with recommendations,[22–24] we identified a sample of potential participants with diverse perspectives, backgrounds and experiences. The medical personnel had to be currently, or in the previous season, engaged in the provision of medical care to a team in the WNL in Ireland. Head coaches had to be currently affiliated with a team in the WNL in Ireland, while players had to be registered with a team in the WNL in Ireland. Representatives from one of the contacted clubs did not participate in the study due to their unavailability.

Data collection

A semistructured interview question schedule (online supplemental file 2) was developed by the research team (DH, SK, MR and ED) through a process of theoretical and pragmatic problematisation,[25] and recommendations identified in the literature.[22 23] The interview guide was also informed by the researchers' experience within the field, further developed

through discussions with the research team (DH, ED, MR and SK), and subsequently refined to enhance rigour after a pilot interview (not included in the study) with a head coach that had considerable previous experience in the WNL. The interviews adopted a conversational and flexible approach,[26 27] involving clarification and elaboration probes that facilitated an in-depth exploration of the research aims.[28] This flexibility allowed the participants to speak freely, share additional insights and digress appropriately from the interview question schedule. This enhanced the fluency of the interviews and enabled the acquirement of rich data.[29] The primary researcher (DH) conducted all the one-to-one interviews with the participants between March 2020 and June 2020 and his *a priori* knowledge of professional football and insider status as a former elite-athlete and Chartered Physiotherapist with elite-level athletes enabled access to and facilitated the establishment of rapport and trust with the participants, as evidenced by the collection of rich and highly sensitive data. Data collection ceased when data and meaning saturation was attained. Specifically, we continued to collect data up to the point when no additional issues were identified and where further data collection may not have provided additional depth, richness and complexities that could hold important meaning for understanding the phenomena of interest.[26 30]

Data analysis

The interview data were analysed using Braun and Clarke's approach to Reflexive Thematic Analysis (RTA).[26 27] The primary researcher (DH) adopted the qualitative stance of 'familiarisation' post-transcription, which involved listening to the audio recorded files and multiple readings of the verbatim transcripts to accurately comprehend the data corpus. The data were inductively analysed using open codes with an emphasis on deriving semantic and then latent codes. Subsequently, initial themes were developed from the coded data and then reviewed. Themes were further refined, defined and named and then analysed for contradictory perspectives, multiple meanings and novel insights before being structured into a framework of higher order themes. We conceptualised themes as 'patterns of shared meaning united by a central concept, developing out of the analytic process following coding'.[26] For sincerity, the primary researcher kept a reflexive journal designed to acknowledge his position[26 30] by documenting his self-critical accounts of the research process to record personal reflections, challenges and insights.[27] Numerous collaborative and reflexive meetings with the research team (DH, SK, MR and ED) were conducted throughout the research to enhance critical dialogue regarding the analytical coding process, theme generation and naming. These meetings were also used to scrutinise and challenge the primary researcher's (co)construction of knowledge and alternative interpretations of the data to ensure they were valid and grounded in the data,[31] and to achieve richer interpretations of meaning.[26 30] In producing this article, continuous drafting and redrafting were an integral part of the data analysis process and to the refinement of the interpretations that are presented.[26 27] The qualitative analysis software, QSR NVIVO-12, assisted in storing, structuring, and organising the data.

Patient and public involvement

This research was conducted without patient or public involvement in the study design, data analysis, writing or editing.

Table 1 Demographic characteristics of participants

Participants	N	Mean age (years)	Sex (M/F)
Players	17	27	17F
Head coaches	7	45	7M
Medical personnel	8	29	6M; 2F

F, female; M, male.

Equity, diversity and inclusion statement

The focus of our study was on women's football in Ireland. Our research team included five men (three senior and two early career researchers) and one woman (senior researcher) from Ireland (n=5) and Sweden (n=1). The positionality of the authors regarding their divergent perspectives, disciplines (eg, physiotherapy, sport and exercise science and sport management) and backgrounds is a potential strength. All authors acted as critical friends by encouraging reflexivity and challenging the construction of knowledge which facilitated greater dimensionality, enhanced objectivity and conformability regarding alternative interpretations of the findings and their implications.[30] We acknowledge that our study on elite-level women's club football in Ireland excludes women and girls playing grassroots football as well as elite-level football in lower resourced settings.

RESULTS AND DISCUSSION

Among those satisfying the criterion-based purposive sampling criteria, coaches (n=7), players (17) and medical personnel (n=8) representing eight of the nine clubs in the WNL in Ireland agreed to participate (table 1). All the head coaches had experience in managing a WNL team. The length of tenure varied with some head coaches having managed for a considerable number of years in the WNL. All the athletes had various years playing experience with a WNL team and some of them had represented the national team at senior or under-age level (ie, under 17/under 19) and some were non-international-level players. All the medical personnel possessed experience of working with a WNL team. Two of the medical personnel were chartered physiotherapists, five were qualified athletic therapists/athletic trainers and one was a student athletic therapist. There were no physicians included because none of the clubs had access to a physician at training or matches on a weekly basis. Due to COVID-19, 28 of the interviews were video-based and conducted online (Zoom/Teams), while the remaining four interviews were conducted face-to-face at a location convenient to the participants. The average length of the interviews was 47 min (range 28–111 min).

Figure 1 outlines the main theme, subtheme and lower order themes that were developed from the data. Our study explored the views of players, head coaches and medical personnel regarding the contextual factors affecting the implementation of injury prevention initiatives and the provision of effective injury management in the WNL in Ireland. The findings highlight the role that systems-related, socioeconomic and demographic factors such as academic/work pressures, financial challenges, conflict with college football, inadequate facilities and gender inequity have on the prevention of injuries.[8] Online supplemental file 3 includes 'NVIVO' (QSR International) coding for all lower order themes. These findings are discussed and presented using representative verbatim statements. Online supplemental file 4 includes additional representative quotes.

Academic and work pressure

Twenty-one participants (4 coaches, 3 medical personnel and 14 players) identified the impact that academic and work pressures

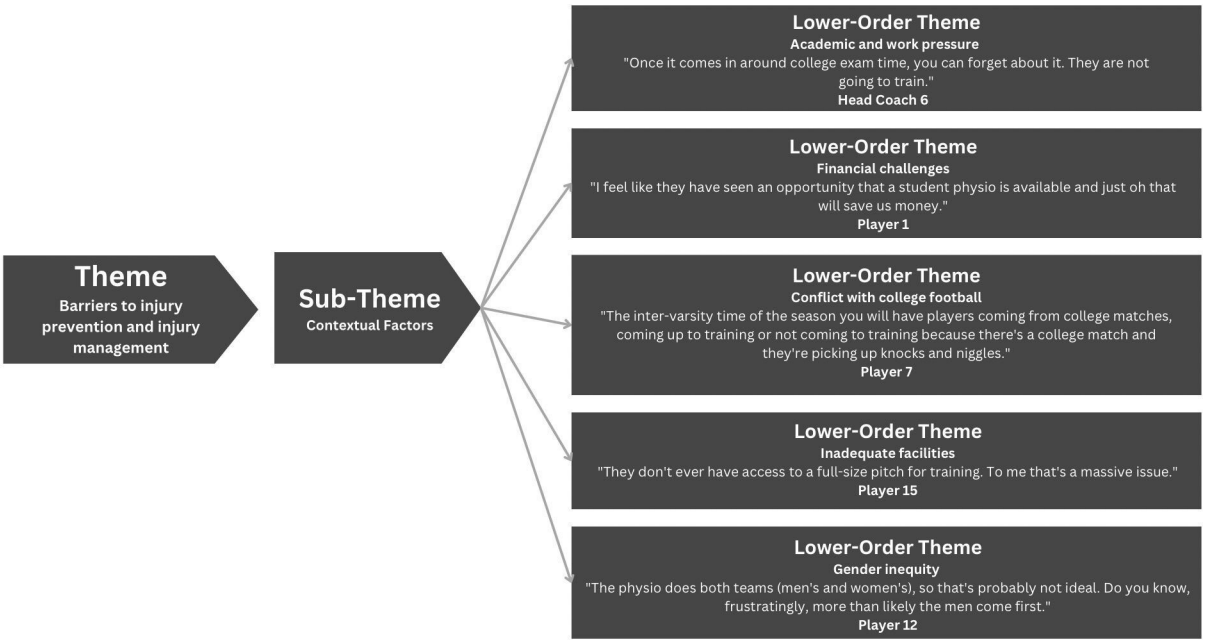

Figure 1 Subtheme and lower order themes within the theme 'barriers to injury prevention and injury management in the WNL'. WNL, Women's National League.

had on players in the WNL. These pressures were perceived to impact on players' availability to train and play matches. Head coach 6 stated:

> Around leaving cert time, you can forget about it. You are not going to get the players for four or six weeks beforehand. The girls that are in college, once it comes in around college exam time, you can forget about it. They are not going to train. It's all college exams. Study is a huge part for the girls more so than the boys.

Players in the WNL in Ireland are all part-time, unpaid amateurs who are either full-time students or in full-time/part-time employment outside their clubs. The majority of participants in our study considered this to be a major impediment to players' technical and tactical development, as well as to the time required for the physical preparation that is necessary to reduce the risk of injury during match play. These issues have also been highlighted in a recent study in elite-level women's football in Norway, which reported that the competing demands of academic and/or work pressures often lead players to drop out of the game.[32] Elite-level women football players in Denmark have also highlighted the substantial challenges of trying to balance their football and academic commitments and, similar to the findings in elite-level women's football in Sweden, only 2% of the surveyed players in the highest division in Denmark were on full-time contracts.[33 34]

Academic and work pressures were also perceived to increase the risk of injury in the WNL. For example, Player 16 stated:

> Oh, you see a lot of people with muscle injuries. A lot having hamstring tightness and quad tightness, calves and I think it takes a lot out. You are physically drained as well. You could see… one of the girls, she's a personal trainer. She does three or four classes a day or even more. Just cycling and stuff like that and she's coming in. She done her ACL three or four years ago and she does the same amount of training as we do, and she has done three or four classes in the meantime before all of us.

Harrison *et al*[35] have detailed how female football players often focus on a dual career pathway due to concerns that injury might end their playing careers prematurely. Similar to the findings in our study, they also highlighted the difficulties that players experience when work commitments interfere with the preparation for and recovery from matches and training. Fox *et al*[36] highlighted similar challenges for players in the women's Australian Football League with players juggling training commitments with other employment, leading to reduced access to facilities, training sessions and medical/athletic development staff. They suggested that this limited players' ability to prepare for the demands of the game, thus potentially increasing their vulnerability to injury. We highlight the importance of developing relationships between women's football clubs and their players' respective employers and academic partners to ensure players have the time to avail of the required levels of medical and S&C support.

Financial challenges

Twenty of the participants (2 coaches, 4 medical personnel and 14 players), highlighted the negative impacts of the limited finances available to the majority of the clubs and the players and staff in these clubs. These financial limitations significantly impacted on the ability of clubs to provide appropriately qualified medical personnel at all training sessions and matches. For example, player 15 expressed a view that the physiotherapist at the club was 'not capable of fulfilling the job. Not capable of diagnosing anything or dealing with anything'. When probed, this player described her experience of a situation where:

> Somebody got a bloody nose in a game and he couldn't deal with that. Just, it's not good enough, as simple as that really. I would have no issue talking to the manager about that stuff and saying it to him but if they (ie, the club) don't have money for somebody better and this is the best that they can do, but that's very frustrating because it's just not right. If you put it all together, how does it feel to be a women's national league player, well it doesn't really feel like anything.

Player 1 described how their team physiotherapist was a student from the local college and stated that, 'I think it should be a qualified physio' with 'far more experience' and 'obviously the level that women are at, at the moment it would be more beneficial to

have a qualified physio there. To be honest I think he doesn't get paid… and is just doing it as part of college and he has to do it, I think that's why he's doing it. I feel like they (ie, the club) have seen an opportunity that a student physio is available and just oh, that will save us money, do you know what I mean?'

None of the clubs were able to employ/hire a qualified S&C coach. There was limited nutrition provision for players after training sessions and matches as well and none of the clubs had access to a qualified performance nutritionist. Eighteen participants (1 coach, 4 medical personnel and 13 players) discussed how a lack of S&C support at their clubs affected players' physical development. Participants also discussed the importance for clubs to have access to qualified and experienced S&C coaches to support the medical personnel in the prevention and management of injuries. For example, player 12 stated:

> Even with the gym stuff like, we have girls that go to the gym. And they could be doing everything that they probably shouldn't be doing by themselves really like you know. Suppose we have just never been educated on it. Like as I said, like some players in the league might know all this but I can guarantee you a lot of them wouldn't. So for me if we were to get that information from strength and conditioning, Jesus can you imagine how much that would help a good percentage of the league like? People probably wouldn't be coming into seasons with injuries.

This sentiment was further echoed by player 7, who stated that some players in the league 'don't really have a clue' and 'they think if they go to the gym, go in and do a few weights, a few machines or whatever and just completely blinded. They've been told to go to the gym to do whatever but is it specific to their sport, how is that helping them, just the fundamentals around it?'

The lack of finances available to clubs in the WNL was identified as a barrier to player development and the protection of player health and welfare. The results are similar to those that were highlighted in a recent study of elite-level male hockey in Ireland where limited club finances led to indequate investment in resouces for players, such as physiotherapy and S&C support.[37] The 2021 FIFA Benchmarking Report highlighted the differences in the financial power of different top-tier leagues with 100% of the first-team players in the leagues in Germany, England, USA, Spain and Australia receiving a monthly salary and having a written contract.[6] In contrast, none of the first-team players in New Zealand were in receipt of a monthly salary despite being ranked 23rd in the world.[6] None of the players in the Irish WNL receive a monthly salary and the financial shortcomings of the clubs was deemed by a majority of the players to be the primary reason for the inadequacies in medical care, S&C expertise and nutrition provision. The results of the FIFA Benchmarking Reports show that clubs with higher revenues can employ more technical staff.[6 13] The 2021 report also showed that in the best-resourced leagues in the world (ie, those with an average of 10 or more technical staff per club), winning clubs had more technical staff than non-winning clubs in 75% of the leagues.[6] This suggests that those clubs that are able to employ specialist staff in areas such as physiotherapy, sports science, S&C, nutrition and psychology have a competitive advantage over those who do not have the financial resources to employ these specialists. These clubs are also more likely to be able to attract and pay better quality players. Larruskain *et al*[2] suggested that the higher injury burden in elite-level women's football in Spain (in comparison to that in elite-level men's football in Spain) may be due to the lower number of technical staff available to the women's team. Whalan *et al*[38] also highlighted the difficulties of assessing and diagnosing non time-loss injuries in part-time football due to lack of access to medical staff, which could increase the risk of future time-loss injuries.

One of the medical personnel (M6) described the impact of his club's financial limitations on his decision-making by highlighting that he 'had offers from other teams on the same (training) nights with double the money so I'm like yes, I'll obviously take that'. He described how there were 'rugby teams I'm working with and hurling teams I'm working with that are implementing my (injury prevention) programmes and we're seeing good results. We're seeing a good reduction in injury rates. So, it is working but they (WNL clubs) don't really have the money to match what these teams are paying'.

Conflict with college football

Fifteen of the participants (3 coaches, 3 medical personnel and 9 players) identified that fixture list clashes (with football scholarship commitments at third-level academic institutions) lead to training and match congestion at different times of the season. Club and university collaboration and alignment is needed to assist players in balancing their football and academic demands.[35] In Ireland, the university football competition calendar clashes with the WNL season at both the start and the end of the season leading to training and match scheduling conflicts. Our results revealed that players felt pressured to satisfy the demands of both their university team and WNL team without compromise. For example, player 7 stated that, 'It is a nightmare. I think a lot of players are put under a lot of pressure because they're on a scholarship'. When probed, this player stated:

> When it comes into the inter-varsity time of the season you will have players coming from college matches, coming up to training or not coming to training because there's a college match and they're picking up knocks and niggles and then you just don't have full numbers at your training to prepare for the women's national league game.

Similarly, player 9 stated:

> I then have national league training on the Tuesday night where I'm expected to train in order to get my space on the starting 11 at the weekend. But I would be going to the training session just after playing 90 minutes maybe 3 hours beforehand. It's just not practical.

Head coach 4 outlined how his players would have 'two sessions on the Tuesday and the Thursday', with the training sessions in the morning being 'part of their academic course so that would be a good session' and 'it would be a heavy enough session…. that's on the days of a club session with me'.

When probed on how he deals with these challenges, coach 4 stated: 'There is an overload there straight away. It's tricky. I would be nearly saying to the players, here tell him (ie, College Head Coach) you have a little strain and you can't train in the college you know. But then the girls are quite honest as well and they don't like to do that either'. This strategy is likely to lead to communication difficulties between club and college coaches and medical personnel and there is evidence from elite-level men's football suggesting that poor quality communication between medical personnel and head coaches is associated with higher injury burden and lower player availability.[39]

Currently, the clubs in the WNL cannot provide players with the financial support in the form of scholarships that many of the universities in Ireland are capable of. Players are often obliged to continue to participate in university training sessions and matches alongside their WNL commitments, leading to periods

of the season with large spikes in training loads and stress levels. This has the potential to increase players' risk of injury, and underscores the need for careful individualised adjustment of training and match exposure.[40] The reduced recovery times between training sessions and matches allied with the pressure to perform at their best in two competitions with different head coaches concurrently, was considered to be a risk factor for injury by many of the participants. In particular, medical personnel 7 described a situation where a player

> was on a scholarship somewhere and they were putting her under pressure to play and she was just coming back into training, not into full training and the college had something coming up and they wanted her to play it. I can't remember what it was but I can remember that it happened twice with her and I remember the second time they did threaten to pull her scholarship unless she played with them. So that was a bit messy.

McCormack and Walseth[41] undertook qualitative research involving elite-level women football players from Norway, who had either migrated to the USA to pursue university football scholarships in the National Collegiate Athletic Association (NCAA) or stayed in Norway to combine playing in the highest league (Toppserien) with university education. Their results suggested that the integrated academic and football experience in the NCAA allowed players to combine football and academic commitments more easily. Some of the players in our study were currently or had previously been recipients of sports scholarships in Irish universities. These players described the difficulties, including trying to stay injury-free, trying to combine representing their university, WNL club and national teams, while also trying to maintain their academic progression. This contrasts with the organisational alignment that exists in the NCAA, where sport and study are accessed on one site, which fosters a dual career pathway (ie, football and academics) more seamlessly.[35] The stress and daily life hassles of balancing academic, work and football commitments that the players in our study consistently described aligns with the findings of a study of elite-level female players in Sweden prior to ACL injury.[42]

Inadequate facilities

Substandard facilities, including an absence of gym facilities and poor training pitch surfaces, was discussed by one-third of the participants (1 coach, 1 medical personnel and 9 players) (online supplemental file 3). For instance, player 13 stated: 'It is hard, facility wise and a lot of it is to do with money to get to pay to go to a gym, then obviously we're amateurs so the girls work during the week so it's hard'.

In a similar manner, player 15 stated:

> I was talking to someone in a different club recently and they were saying that they don't ever have access to a full-sized pitch for training. To me that's a massive issue. If that's something that the FAI (Football Association of Ireland) could help with or there could be funding available for it or if funding was the issue or whichever. That certainly should be something that should be looked at.

Head coach 5 stated

> We have done the three days on a Monday, Wednesday, Saturday but as the season was starting I wanted Monday, Wednesday and Thursday and then we're hoping that we will go to a Monday, Tuesday, Thursday, when the season starts. Again, it comes down to facilities…massive challenge. I tried to change it this year but could only get the Monday. Monday, Wednesday Saturday so you have got to go with it. I've just said to the chairman that I definitely need the Thursday.

Donaldson and Finch[43] included availability of appropriate facilities in the organisational drivers that support the high-fidelity implementation of injury prevention strategies. The 2022 FIFA Benchmarking Report in Women's Football highlighted some improvements in the facilities that were available to clubs in the surveyed leagues in comparison to the 2021 report.[13] The percentage of clubs that had access to a gym, a medical/physiotherapy treatment room and food catering for players had increased by 12%, 15% and 25%, respectively. Despite this, 9% and 13% of top-tier women's football clubs still do not have access to a medical/physiotherapy room or gym, respectively, while three out of 10 clubs do not provide food catering to players in the highest leagues in women's football.

In an effort to address these inadequacies, FIFA's recently published club licencing guide in women's football advises member associations to ensure that all clubs that are granted licenses have organisational systems in place, including facilities, that could improve communication between the relevant stakeholders (eg, coaches, medical personnel and players).[16] However, each member association will be responsible for implementing FIFA's club licensing recommendations and, we argue that without FIFA led oversight, member associations may choose not to implement many of the proposed interventions because they consider it more important to invest increasing amounts in men's football to the detriment of the women's game.

Gender inequity

Five of the players and one coach expressed their frustration at what they perceived as gender inequity, particularly in relation to medical care and access to facilities (online supplemental file 3). Differences in the quality of medical care and S&C support have been highlighted between elite-level men's and women's Swedish and Spanish club players, and a survey of national team players competing in the 2019 FIFA Women's World Cup also highlighted the deficits that exist at club level.[2 5 33] Similarly, our results highlight the inequity between the medical care and S&C support provided to players in the WNL in comparison to their male counterparts; the impact this had on injury prevention, diagnosis and rehabilitation was a source of considerable frustration among the players who participated in our study. For example, player 12 stated: 'I don't know if it's funds, I don't know if it's, well in our particular case the physio does both teams (men's and women's), so that's probably not ideal. Do you know, frustratingly, more than likely the men come first. That's just very frustrating'. This player expressed her fears for her own and her teammates' health, as well as her frustration that her yearly requests for improved medical support were 'falling on deaf ears' and stated: 'But my fear is, if anything happened to one of us, of a training night you know yourself, a clash of heads, bad landing and someone who I suppose has the highest qualifications, should really be there. And this is something we have mentioned for years, trust me'.

In a similar manner, player 3 expressed considerable frustration regarding the inequitable treatment of women's football in Ireland and stated:

> It leaves a lot to be desired in terms of equality and stuff like that, but I don't, I have never come across other sports or heard of other sports where a women's team is waiting for the men's team to finish training so they can get into the dressing room before a game. One day we were waiting 45 minutes so obviously our warmup had to be changed. If you are having a team meeting, that had to be shortened. It just creates an unnecessary tension before the game even starts. I think if you are playing another sport you are going to go well look we don't have to wait to go into a match here, I

> have had enough of this like, I don't need this shit. They (ie, fellow players/teammates) might say look I'm going to work that Sunday like, I am going to play camogie (ie, alternative Irish sport) that week. Even some XXXX Senior League men's teams have fully trained physios like so why shouldn't we? We're the elite level in this whole thing why shouldn't we have a fully trained physio. I don't see why there shouldn't be, I really don't.

Head coach 4 expressed similar views regarding the disparaging treatment towards the women's game in Ireland in comparison to their male counterparts. He gave an example of when there might be a concert on during the year and described how 'funny enough…a whole chunk of the women's players will want to go to that (big) concert rather than attend a training session' and suggested that 'I wouldn't have found it with the men's game'. When probed why, he suggested that 'it is probably because… there isn't any reward system really there for the women and they are probably thinking right, I'm going'. This head coach went on to suggest that 'there's a bit of that because they don't get the same rewards as the men's and so the men are getting more from it financially'. Of significant importance though, was this head coaches view that, 'that's not to say that the women aren't as committed. They are probably even more committed in what they do when you think about it'.

Dix *et al*[9] suggested that the cost of hiring an S&C coach to oversee exercise-based injury prevention programmes may be perceived by coaches as a barrier to the implementation of such programmes. Several of the players discussed how uneducated players in the WNL are about strength training, and this may be due to a lack of access to S&C expertise in their formative years before they entered the WNL. McQuilliam *et al*[44] in their survey of male and female academy and first team football S&C coaches in the UK, Spain, Germany, Italy, Portugal, Brazil, Uruguay and the USA suggested that the reported lower number of in-season S&C sessions for female academy players in comparison to male players may have negatively affected their physical development and increased their vulnerability to injury. McHaffie *et al*[45] recently reported how elite-level players in the Women's Super League in England also described inequities in the provision of nutrition support between them and the male players in their clubs. This discrepancy in access to S&C and nutrition expertise for female players in comparison to their male peers fits with the gendered environmental differences that Fox *et al*[36] and Parsons *et al*[3] suggest are likely factors leading to the increased incidence of severe knee injuries such as ACL tears. Players in our study identified that weight training was perceived as being more suited to men than women by some of their team-mates, reinforcing historical stereotypes that limit the athletic development of women football players in a sport that is becoming increasingly physically demanding.[46 47] For example, player 16 stated:

> You go into any gym, there's probably more men than women in the gym and probably if there are more women they are on the treadmill or the cross trainer. They are not near the weights, or they are not near bands. I think women think that if I'm doing weights, I'm going to look a lot bulkier and I'm not going to look like a woman. They are more concerned about their self-image than being an athlete or looking like an athlete.

The lack of access to S&C expertise and the perception that weight training is not for women inevitably leads to poor strength development and deficits in hip muscle strength are a risk factor for ACL injury in both female and male athletes.[48] Lucarno *et al*[49] reported that over 80% of the ACL injuries they analysed in their systematic video analysis of ACL injuries in professional female football players were incurred during defensive pressing/tackling and regaining balance after kicking. This may associate with strength, power and change of direction deficits as a consequence of suboptimal S&C support at club level. ACL injuries can have catastrophic long-term consequences for women footballer players,[50] and have been shown to have the highest injury burden of any injury sustained by players in the Irish WNL.[1] They also accounted for 43% of all the time lost due to injury in elite-level Spanish club players.[2]

While the FIFA Women's Football Strategy 2018[51] emphasised FIFA's commitment to address these inequities, both on and off the pitch, Krech[52] suggested that this strategy is limited due to the lack of any representation from players. Patient and public engagement is a core element of healthcare and athletes, coaches and medical personnel should be actively engaged in the design of research.[53] Arguably, our study begins to address this lack of player representation and could provide governing bodies with evidence to begin addressing health-related inequities of substantial importance that have been voiced by players themselves.

Policy implications

There is an onus on football governing bodies to require women's football leagues and clubs to provide the financial supports needed to implement effective medical care and S&C programmes. Football club and academic partnerships are critical to facilitate the development of dual career athletes who attain the qualifications and skills to gain employment outside of football during and after their playing careers. Football administrators responsible for fixture lists need to ensure that players involved in collegiate, and club national league competitions are not exposed to avoidable fixture congestion at different parts of the season. Governing bodies have a duty to implement policies that ensure gender equity in relation to access to facilities, as well as medical care and S&C expertise.

Limitations

While randomly selecting participants may have produced different results and removed any potential selection bias, we employed data triangulation (ie, players, head coaches and medical personnel) in the collection of data to enhance credibility and representativeness.[29] However, the sample limitations may be offset by the highly specialised nature of the participants and their knowledge and experience with the current research topic. We also acknowledge that non-random samples may lack representativeness, are non-probabilistic and may lack generalisability.[29] Unlike statistical generalisations, naturalistic generalisations[31] and transferable findings may be tentatively used to extrapolate to recent studies in elite women's football,[6] thus establishing a platform for further comparisons. The findings are limited to elite-level women's club football in Ireland but may resonate[31] with researchers in elite-level women's football, and with practitioners tasked with implementing injury prevention and management strategies. Regarding researcher triangulation, and to enhance credibility, all the authors acted as critical friends[30] by engaging in a process of critical dialogue, which was designed to challenge and scrutinise interpretations of the findings.[29] While these findings are contextual and circumstantial, the use of rich descriptions allows the reader to judge the findings and our interpretations thus also increasing dependability.[54] In terms of rigour, additional criteria adhering to COREQ (online supplemental file 1) were employed.[23 30 54]

Conclusion

Contextual factors, such as academic and work pressures, clubs' lack of finance, conflict with college football, inadequate facilities

and gender inequity, were identified as barriers to implementing injury prevention initiatives and the provision of effective injury management to players in the WNL in Ireland.

Twitter Dan Horan @DanHoran10, Eamonn Delahunt @EamonnDelahunt, Martin Hägglund @MHgglund and Catherine Blake @Blake_Cath

Contributors DH, SK, ED and MR developed the reasoning for this paper and designed the semistructured interview format. DH undertook all the interview and was the main coder. SK, ED, MR, CB and MH contributed intellectually and provided feedback on various drafts. DH and ED are co-guarantors of the manuscript.

Funding DH is the recipient of an Irish Research Council Enterprise Partnership Scheme (Postgraduate) award (EPSPG/2019/543). This scheme provides funding for PhD students to undertake research with a specified enterprise partner; in this instance, the enterprise partner is the Football Association of Ireland. The Irish Research Council and the Football Association of Ireland were not involved in any aspect of this study, such as the design of the study's protocol and analysis plan.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval This study involves human participants and was approved by University College Dublin Human Research Ethics Committee (LS-21-37-Horan-Delahunt). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

ORCID iDs
Dan Horan http://orcid.org/0000-0002-8806-2868
Eamonn Delahunt http://orcid.org/0000-0001-5449-5932
Martin Hägglund http://orcid.org/0000-0002-6883-1471

REFERENCES

1 Horan D, Blake C, Hägglund M, *et al*. Injuries in elite-level women's football-a two-year prospective study in the Irish Women's National League. *Scand J Med Sci Sports* 2022;32:177–90.
2 Larruskain J, Lekue JA, Diaz N, *et al*. A comparison of injuries in elite male and female football players: a five-season prospective study. *Scand J Med Sci Sports* 2018;28:237–45.
3 Parsons JL, Coen SE, Bekker S. Anterior Cruciate ligament injury: towards a gendered environmental approach. *Br J Sports Med* 2021;55:984–90.
4 Tee JC, McLaren SJ, Jones B. Sports injury prevention is complex: we need to invest in better processes, not singular solutions. *Sports Med* 2020;50:689–702.
5 Geertsema C, Geertsema L, Farooq A, *et al*. Injury prevention knowledge, beliefs and strategies in elite female Footballers at the FIFA women's world cup France 2019. *Br J Sports Med* 2021;55:801–6.
6 FIFA Benchmarking report women's football. In: *Setting the Pace*. 2021.
7 Gabbett TJ, Kearney S, Bisson LJ, *et al*. Seven tips for developing and maintaining a high performance sports medicine team. *Br J Sports Med* 2018;52:626–7.
8 Owoeye OBA, Rauvola RS, Brownson RC. Dissemination and implementation research in sports and exercise medicine and sports physical therapy: translating evidence to practice and policy. *BMJ Open Sport Exerc Med* 2020;6:e000974.
9 Dix C, Logerstedt D, Arundale A, *et al*. Perceived barriers to implementation of injury prevention programs among collegiate women's soccer coaches. *J Sci Med Sport* 2021;24:352–6.
10 de Haan D, Sotiriadou P. An analysis of the multi-level factors affecting the coaching of elite women athletes. *Manag Sport Leis* 2019;24:307–20.
11 Culvin A. Football as work: the lived realities of professional women footballers in England. *Manag Sport Leis* 2023;28:684–97.
12 Welford J. Outsiders on the inside: integrating women's and men's football clubs in England. In: Pfister G, Pope S, eds. *Female football players and fans. Football research in an enlarged Europe*. London: Palgrave Macmillan, 2018.
13 FIFA Benchmarking report women's football. In: *Setting the Pace*. 2022.
14 FIFA Women's Football Development Programme, Available: https://www.fifa.com/womens-football/development-programmes [Accessed 17 Jun 2022].
15 UEFA Women's Football Development Programme, Available: https://editorial.uefa.com/resources/025f-0fff0dce7b19-5db19c89f686-1000/uefa_wfdp_national_association_projects_2020.pdf [Accessed 17 Jun 2022].
16 FIFA Guide to Club Licensing in Women's Football 2022, Available: https://digitalhub.fifa.com/m/26ed8fae521947ad/original/FIFA-Guide-to-Club-licensing-in-women-s-football_EN.pdf [Accessed 17 Jun 2022].
17 Okholm Kryger K, Wang A, Mehta R, *et al*. Can we evidence-base injury prevention and management in women's football? A Scoping review. *Res Sports Med* 2023;31:687–702.
18 Arundale AJH, Silvers-Granelli HJ, Myklebust G. ACL injury prevention: where have we come from and where are we going *J Orthop Res* 2022;40:43–54.
19 Sandberg J. How do we justify knowledge produced within interpretive approaches? *Organ Res Methods* 2005;8:41–68.
20 Schwandt TA. Constructivist, interpretivist approaches to human inquiry. In: Denzin N, Lincoln Y, eds. *The landscape of qualitative research: theories and issues* . 1994: 1. 221–59.
21 Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care* 2007;19:349–57.
22 Bekker S, Bolling C, H Ahmed O, *et al*. Athlete health protection: why qualitative research matters. *J Sci Med Sport* 2020;23:898–901.
23 Bolling C, Delfino Barboza S, van Mechelen W, *et al*. Letting the cat out of the bag: athletes, coaches and Physiotherapists share their perspectives on injury prevention in elite sports. *Br J Sports Med* 2020;54:871–7.
24 Bonell Monsonís O, Verhagen E, Kaux J-F, *et al*. I always considered I needed injury prevention to become an elite athlete': the road to the Olympics from the athlete and staff perspective. *BMJ Open Sport Exerc Med* 2021;7:e001217.
25 Alvesson M, Sandberg J. Generating research questions through problematization. *Acad Manage Rev* 2011;36:247–71.
26 Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qual Res Sport Exerc Health* 2019;11:589–97.
27 Braun V, Clarke V. One size fits all? What counts as quality practice in (Reflexive) thematic analysis. *Qual Res Psychol* 2021;18:328–52.
28 Dulay MT, Zaman N, Jaramillo D, *et al*. Pathogen-imprinted organosiloxane polymers as selective biosensors for the detection of targeted *e. coli C (Basel)* 2018;4:29.
29 Skinner J, Edwards A, Smith AC, eds. Qualitative research in sport management. 2nd edn. London: Routledge, 2021.
30 Smith B, McGannon KR. Developing rigor in qualitative research: problems and opportunities within sport and exercise psychology. *Int Rev Sport Exerc Psychol* 2018;11:101–21.
31 Smith B. Generalizability in qualitative research: misunderstandings, opportunities and recommendations for the sport and exercise sciences. *Qual Res Sport Exerc Health* 2018;10:137–49.
32 Bjerksæter IAH, Lagestad PA. Staying in or dropping out of elite women's football-factors of importance. *Front Sports Act Living* 2022;4:856538.
33 Hägglund M, Waldén M, Ekstrand J. Injuries among male and female elite football players. *Scandinavian Med Sci Sports* 2009;19:819–27.
34 Brandt-Hansen M, Ottesen LS. Caught between passion for the game and the need for education: a study of elite-level female football players in Denmark. *Soccer & Society* 2019;20:494–511.
35 Harrison GE, Vickers E, Fletcher D, *et al*. Elite female soccer players' dual career plans and the demands they encounter. *J Appl Sport Psychol* 2022;34:133–54.
36 Fox A, Bonacci J, Hoffmann S, *et al*. Anterior Cruciate ligament injuries in Australian football: should women and girls be playing? you're asking the wrong question. *BMJ Open Sport Exerc Med* 2020;6:e000778.
37 Rees H, Matthews J, McCarthy Persson U, *et al*. The knowledge and attitudes of field hockey athletes to injury, injury reporting and injury prevention: a qualitative study. *J Sci Med Sport* 2022;25:820–7.
38 Whalan M, Lovell R, Sampson JA. Do Niggles matter? - increased injury risk following physical complaints in football (soccer). *Science and Medicine in Football* 2020;4:216–24.
39 Ekstrand J, Lundqvist D, Davison M, *et al*. Communication quality between the medical team and the head coach/manager is associated with injury burden and Player availability in elite football clubs.British. *Br J Sports Med* 2019;53:304–8.
40 Impellizzeri FM, Menaspà P, Coutts AJ, *et al*. Training load and its role in injury prevention, part I: back to the future. *J Athl Train* 2020;55:885–92.
41 McCormack C, Walseth K. Combining elite women's soccer and education: Norway and the NCAA. *Soccer & Society* 2013;14:887–97.
42 Ivarsson A, Johnson U, Karlsson J, *et al*. Elite female footballers' stories of sociocultural factors, emotions, and behaviours prior to anterior cruciate ligament injury. *Int J Sport Exerc Psychol* 2019;17:630–46.
43 Donaldson A, Finch CF. Applying implementation science to sports injury prevention. *Br J Sports Med* 2013;47:473–5.

44 McQuilliam SJ, Clark DR, Erskine RM, *et al*. Mind the gap! A survey comparing current strength training methods used in men's versus women's first team and Academy soccer. *Sci Med Footb* 2022;6:597–604.
45 McHaffie SJ, Langan-Evans C, Morehen JC, *et al*. Carbohydrate fear, Skinfold targets and body image issues: a qualitative analysis of Player and Stakeholder perceptions of the nutrition culture within elite female soccer. *Sci Med Footb* 2022;6:675–85.
46 Coen SE, Rosenberg MW, Davidson J. "It's gym, like G-Y-m not J-I-m": exploring the role of place in the Gendering of physical activity. *Soc Sci Med* 2018;196:29–36.
47 Bradley P, Scott D. FIFA. Physical Analysis of Women's World Cup 2019, Available: https://img.fifa.com/image/upload/zijqly4oednqa5gffgaz.pdf [Accessed 10 Oct 2022].
48 Khayambashi K, Ghoddosi N, Straub RK, *et al*. Hip muscle strength predicts Noncontact anterior Cruciate ligament injury in male and female athletes. *Am J Sports Med* 2016;44:355–61.
49 Lucarno S, Zago M, Buckthorpe M, *et al*. Systematic Video analysis of anterior Cruciate ligament injuries in professional female soccer players. *Am J Sports Med* 2021;49:1794–802.
50 Lohmander LS, Ostenberg A, Englund M, *et al*. High prevalence of knee osteoarthritis, pain, and functional limitations in female soccer players twelve years after anterior Cruciate ligament injury. *Arthritis Rheum* 2004;50:3145–52.
51 FIFA Women's Football Strategy 2018, Available: https://digitalhub.fifa.com/m/baafcb84f1b54a8/original/z7w21ghir8jb9tguvbcq-pdf.pdf [Accessed 17 Jun 2022].
52 Krech M. Towards equal rights in the global game? FIFA strategy for women's football as a tightly bounded institutional innovation. *Tilburg Law Review* 2020;25:12–26.
53 Kemper S, Bongers M, Slok E, *et al*. Patient and public engagement in decision-making regarding infectious disease outbreak management: an integrative review. *BMJ Glob Health* 2021;6:e007340.
54 Tracy SJ. Qualitative quality: eight "big-tent" criteria for excellent qualitative research. *Qualitative Inquiry* 2010;16:837–51.

Supplementary File 1

Manuscript Title: "More than likely the men come first. That's just very frustrating." A qualitative exploration of contextual factors affecting the implementation of injury prevention initiatives and the provision of effective injury management in elite-level women's football in Ireland.

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from:

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007;19:349 – 357.

No. Item	Guide questions/description		Reported on Page #
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.Interviewer/facilitator	Which author/s conducted the interview or focus group?	Dan Horan conducted all the interviews.	Reported page 6
2. Credentials	What were the researcher's credentials? E.g., PhD, MD	Bachelor of Commerce Degree, University College Dublin. MSc Administrative Studies, Boston College, USA. MSc Exercise and Health Sciences, University of Bristol. MSc Physiotherapy, Queen Margaret University, Edinburgh.	Not reported
3. Occupation	What was their occupation at the time of the study?	Part-time PhD Researcher, Chartered Physiotherapist, Head of Research at the Football Association of Ireland	Not reported
4. Gender	Was the researcher male or female?	Male	Not reported
5. Experience and training	What experience or training did the researcher have?	He has published an injury surveillance study and a systematic review and meta-analysis as well as qualitative research. Additional manuscripts are currently undergoing peer-review. As part of his PhD in	Not reported

		UCD, he completed training in advanced qualitative analysis, knowledge synthesis, systematic reviews, and meta-analysis.	
Relationship with participants			
6. Relationship established	Was a relationship established prior to study commencement?	Some Participants (Players: n=12; head coaches: N=6; medical personnel: N=2) were known to the first author through his experience working as a physiotherapist for numerous teams in Ireland and through their involvement in previous research. The remainder (n=12) were not known to the researcher prior to being contacted and subsequently interviewed.	Not reported
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	All participants were aware that the researcher was a PhD student at University College Dublin. All participants received an information letter by email outlining a general overview of the research.	Not reported
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g., Bias, assumptions, reasons, and interests in the research topic	The Interviewer was a Chartered Physiotherapist with extensive experience in elite-level and international football and was Head of Research at the Football Association of Ireland.	Not reported

Domain 2: study design			
Theoretical framework			
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, ethnography, phenomenology, content analysis	This study is located within an interpretive, constructivist research paradigm. This paradigm assumes that reality exists in the form of multiple individuals' constructions about the world which are shaped through lived experiences and that there is no single external reality of the individual. Unlike descriptive or positivist approaches, a more interpretivist, constructivist approach was adopted which places more emphasis on inductive exploration and where meaning and experience are socially produced and reproduced.	Not reported
Participant selection			
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Non-probability sampling techniques, or purposive sampling, often referred to as "judgement samples" was adopted where participants were recruited [3] based on the personal judgement of, and numerous discussions between, the research team (DH, SK, ED). Rather than breadth, our aim was to recruit participants based on relevance and variations in the participants in terms of their demographics, characteristics, and experiences [3]. Consequently, participants were selected that could provide more relevant data and a deeper understanding based on their 'connection to' and 'involvement in' the research topic [3]. The sample was subjected to extensive and in-depth data examination leading to a greater level of understanding of the research aims.	Not reported
11. Method of approach	How were participants approached? e.g., face-to-face, telephone, mail, email	Following institutional ethical approval, all potential participants received an email from the FAI's High Performance Director with information about the proposed study. Potentially	Reported pages 5 & 6

		interested participants contacted him expressing their interest in participating. He provided these participants with the primary researcher's contact details, and they contacted him. All participants received an introductory telephone call and email from the primary researcher (DH), that provided an initial overview of the study and an invitation to participate.	
12. Sample size	How many participants were in the study?	Determining the "correct size" of a qualitative sample is a contentious issue in qualitative research [3]. Our goal was to capture variation, or breadth, across participants and we argue that the sample size provides reasonable coverage [3]. Rich, in-depth data was collected from information-rich participants.	Not reported
13. Non-participation	How many people refused to participate or dropped out? Reasons?	One of the contacted participants did not participate in the research due to their unavailability.	Reported page 6
Setting			
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Due to COVID-19, 28 of the interviews were video-based and took place online (Zoom/Teams). 4 took place face-to-face at a location convenient to the participants.	Reported, page 8
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	No.	Not reported
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Athletes had various alternative careers or educational commitments. The medical and sport science support staff is heterogeneous among clubs and is largely dependent upon the financial resources of the clubs. Some demographic information has been withheld to protect coach anonymity and to avoid any potential for deductive disclosure due to the small number of head coaches.	Not reported

Data collection			
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Semi-structured interviews are appropriate when exploring participants understanding and interpretation of the specific research questions being discussed [3]. A semi-structured interview guide (Supplementary file 2) was developed through a process of gap spotting [6, 7] and theoretical and pragmatic problematisation [8] of the literature (e.g., injury management and prevention, health protection) to bridge the gap between research and practice.	Reported page 6
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	No	Not reported
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	All the interviews were recorded using a Dictaphone and laptop audio recorder software. Due to COVID-19, 28 of the interviews were video-based and took place online (i.e., Zoom/teams). While in-person interviews are often viewed as marginally superior to video-based interviews, participants in video-based interviews often divulge more personal details and there are limited restrictions in developing rapport or disclosing sensitive issues [9].	Not reported
20. Field notes	Were field notes made during and/or after the interview or focus group?	The first author maintained a reflective journal throughout the study.	Not reported
21. Duration	What was the duration of the interviews or focus group?	The average length of the interviews was 47 minutes (range 28-111 minutes).	Reported page 8
22. Data saturation	Was data saturation discussed?	Data and meaning saturation identified in-text and was attained [4, 5]. Saturation, or informational redundancy, was reached where data collected from additional subjects would not contribute any new information [3].	Not reported
23. Transcripts returned	Were transcripts returned to participants for	The transcripts were transcribed verbatim, returned to all the	Not reported

	comment and/or correction?	participants and they were invited to provide any comments or reflections. No modifications were made, or feedback provided by the participants. Consequently, the adoption of member participant validation ensured that the meanings of the statements spoken during the interviews were accurately transcribed by the researcher, thereby enhancing the conformability and credibility of the data [5].	
Domain 3: analysis and findings			
Data analysis			
24. Number of data coders	How many data coders coded the data?	In the early stages of data analysis, SK independently open-coded a sample (n=6) of transcripts to sense-check how DH was coding the data, to compare initial insights generated using memos, discuss connections between the codes and themes, and to explore alternative interpretations of the data. After data collection ceased, SK and MR independently open-coded a separate sample (n=6) of transcripts. For confirmability and dependability, and by providing neutrality to the findings,[23] peer-triangulation was adopted during the coding process involving two coders (SK, MR) who had extensive experience of qualitative research. The aim was not about 'achieving consensus between coders' but concerned their collaborative 'reflective and thoughtful engagement' with the data and 'the analytic process'[26] to develop a richer more nuanced reading of the data.[27] SK and MR possessed no medical experience but are experienced qualitative researchers and SK has experience at various coaching and playing levels of professional and semi-professional soccer. Minor discrepancies in the latent codes and theme naming were discussed. Overall,	Not reported

		this double review involved discussion of the coding process, and the generation of main themes, and sub-themes. Then, SK, DH and ED discussed the findings over two meetings and the themes and any discrepancies in the naming of the themes were discussed.	
25. Description of the coding tree	Did authors provide a description of the coding tree?	Detailed description of reflective thematic analysis provided, combined with visual representation of the codes and themes in the appendices.	Reported page 7
26. Derivation of themes	Were themes identified in advance or derived from the data?	Theme and sub-themes derived from data.	Reported page 7
27. Software	What software, if applicable, was used to manage the data?	The qualitative analysis software (QSR NVIVO-12) assisted in storing, structuring, and organising the data.	Reported page 7
28. Participant checking	Did participants provide feedback on the findings?	Providing feedback on the findings with the participants was not completed because of methodological and pragmatic challenges [10, 5]	Not reported
Reporting			
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Quotations from a range of different participants are used to illustrate themes and findings in the text. Additional quotations are included in supplementary file 4. All quotations are identified by participant number.	Reported pages 9-17 and supplementary file 4
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Consistency between data presented and the study findings was achieved.	Reported pages 9-17
31. Clarity of major themes	Were major themes clearly presented in the findings?	The main themes are derived from the data. Themes are clearly presented in-text.	Reported pages 9-16
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	The minor themes are derived from the data. Minor themes are clearly presented in-text.	Reported pages 9-16

References

1. Sandberg, J. How do we justify knowledge produced within interpretive approaches? *Organizational research methods.* 2005;8:41-68.

2. Schwandt, T. A. Constructivist, interpretivist approaches to human inquiry. Handbook of qualitative research, 1(1994). In Denzin, N. and Lincoln, Y (Eds.), The Landscape of Qualitative Research: Theories and issues. (pp. 221-259). Thousand Oaks, CA: Sage Publications.

3. Skinner, J., Edwards, A., & Smith, A. C. (Eds.). Qualitative research in sport management (2nd Edition). 2021. London: Routledge.

4. Braun, V., & Clarke, V. Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise and health.* 2019;11:589-597.

5. Smith, B., & McGannon, K. R. Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International review of sport and exercise psychology.* 2017;11:101-121.

6. Bolling C, Delfino Barboza S, van Mechelen W, Pasman HR. Letting the cat out of the bag: athletes, coaches and physiotherapists share their perspectives on injury prevention in elite sports. *Br J Sports Med.* 2020;54:871-877.

7. Bekker, S, Bolling, C, H Ahmed, O, Badenhorst M, Carmichael J, Fagher K, et al. Athlete health protection: why qualitative research matters. *J Sci Med Sport*. 2020;23:898–901.

8. Alvesson, M., & Sandberg, J. Generating research questions through problematization. *Academy of management review.* 2011;36:247-271.

9. Howlett M. Looking at the 'field' through a Zoom lens: Methodological reflections on conducting online research during a global pandemic. *Qual Res.* 2022;22:387-402.

10. Tracy, S. J. Qualitative quality: Eight “big-tent” criteria for excellent qualitative research. *Qualitative inquiry.* 2010;16:837-851.

Supplementary File 2

Player interview guide

1. How do you know you are ready to perform in a game?

2. How do you know you are not ready to perform in a game?

3. (a) What information informs these decisions?

   (b) What do you use to measure match performance?

   (c) What are your key performance indicators?

4. Who decides if players are available to play?

5. (a) What strategies are used to ensure players are available to play?

   (b) Who or what influences these strategies?

6. What are the core competencies required of medical personnel working in elite-level women's football?

7. What are the core competencies required of strength and conditioning coaches working in elite-level women's football?

8. How do you know the club approach is working?

9. Tell me your views on the gathering of all the injury surveillance data?

10. Is there anything else that we haven't discussed about player availability that you think is important?

Medical personnel and head coaches interview guide

1. How do you know players are ready to perform in a game?

2. How do you know players are not ready to perform in a game?

3. (a) What information informs these decisions?

   (b) What do you use to measure match performance?

   (c) What are your key performance indicators?

4. Who decides if players are available to play?

5. (a) What strategies are used to ensure players are available to play?

   (b) Who or what influences these strategies?

6. What are the core competencies required of medical personnel working in elite-level women's football?

7. What are the core competencies required of strength and conditioning coaches working in elite-level women's football?

8. How do you know the club approach is working?

9. Tell me your views on the gathering of all the injury surveillance data?

10. Is there anything else that we haven't discussed about player availability that you think is important?

Supplementary File 3

Theme: Barriers to injury prevention and injury management in the Irish WNL NVIVO coding

Theme	Sub-theme	Lower order theme	Number of participants	Number of quotes
Barriers to injury prevention and injury management				
	Contextual factors		30 (7C[a]; 7M[b]; 16P[c])	291
		Academic and work pressure	21 (4C; 3M; 14P)	48
		Financial challenges	20 (2C; 4M; 14P)	57
		Lack of strength and conditioning investment	18 (1C; 4M; 13P)	35
		Conflict with college football	15 (3C; 3M; 9P)	39
		Inadequate facilities	11 (1C; 1M; 9P)	17
		College scholarships	8 (1C; 2M; 5P)	10
		Fixture list and season planning	8 (1C; 7P)	18
		Social side to the game	8 (3C; 1M; 4P)	24
		Gender inequity	6 (1C; 5P)	13
		International football	4 (1M; 3P)	6
		Players leaving to the GAA	4 (4P)	10
		Poor coaching standards for players before entering WNL	2 (2C)	2
		Personal problems of players	3 (1C; 1M; 1P)	4
		Club versus country challenges	1 (1C)	5
		Pre-season	1 (1P)	3

[a]Head Coaches; [b]Medical Personnel; [c]Players

Supplementary File 4: Example quotes supporting the Theme "Barriers to Injury Prevention and Injury Management in the WNL'" and its associated Sub-Theme (contextual factors) and Lower-Order Themes (Academic and Work Pressure; Financial Challenges; Conflict with College Football; Inadequate Facilities; Gender Inequity).
WNL = Women's National League; C = Head Coach; M = Medical personnel; P = Player

Lower-Order Theme: Academic and work pressure

Interview	Supporting Evidence
M3	I suppose just, again, an awful lot of them work, they are in college. There is an awful lot of demand on them so getting the balance right is a big thing for them. A good balance between training. Again, you look at… I know you can't compare yourself to other teams, you can just do what's right for your team but if you did see another team say they went and done a 10k or they done this or they done that, that would be too much on our girls, I know that much because I know some of them work. Some of them are in the hospitals now as we speak.

Lower-Order Theme: Financial challenges

Interview	Supporting Evidence
P10	I think a lot of the girls are working, we're not being paid to play football here. You're either in college or you're working full-time or you're in college and working part-time so it's difficult to get the girls available to give that much time when they're not being paid to play.
C1	We have about two girls who are in full time employment and the rest are college or school and then they have to work, obviously the money side of it, if they were being looked after financially, I am saying if they were able to not have to work at the weekends or on a training night. I have had situations where girls can't come training on Tuesday night because they have to work to put themselves through college or little things like that or to run a car. No club, that I am aware of

	and especially the women's national league, are in a position to pay any girls and that would probably include expenses as well and I just find that that is another thing.
M6	I have had offers from other teams on the same nights with double the money so I'm like yes, I'll obviously take that. Especially from being in XXXX myself I want to see women's soccer in the region and I want to do my best to help them with it but at the end of the day when you are running a business and you're self-employed that's what you have to look out for as well….Because there are rugby teams I'm working with and hurling teams I'm working with that are implementing my programs and we're seeing good results. We're seeing a good reduction in injury rates. So, it is working but they don't really have the money to match what these teams are paying.

Lower-Order Theme: Conflict with college football

Interview	**Supporting Evidence**
C3	College football is ran by the FAI, they put the fixtures out so they probably need to look at… if college football is on now and it is nearly finishing, why not start the league two or three weeks later and let college football finish rather than… this Thursday we have four girls playing in a game and we play XXXX on Saturday. We train Wednesday and Friday. And it's a final. It's a college final so the girls have to play. That doesn't help. It doesn't help me; it definitely doesn't help XXXX because they have players in the same boat.
M5	I think just again the training load comes in. Some players might have been struggling from little things like some minor niggles or even some players might have had some shin splints, some very basic MTSS type symptoms just from over high levels of running on astro and it can be tricky having that conversation that they need to slow down. There was certain times in the year when that became a bit more tricky so when both seasons were happening at the same time.

Lower-Order Theme: Inadequate facilities

Interview	Supporting Evidence
M2	Just from hearing stories of what the players were saying they would turn up to games a lot of the times and there wouldn't even be a dressing room for them in previous years.
P10	We don't do a lot of running. We're usually on not even half of the astro. A little bit of the astro where you wouldn't even get much running in.
P12	Probably facilities, I don't know actually. Like I think the girls would train as many nights as they could. I just don't know if it has ever been talked about and you know we would struggle at times to get pre-season facilities believe it or not this year at times, so I don't know, I don't know why.
P7	I think probably resources at the club, pitch times etc. can be an issue as well.

Lower-Order Theme: Gender inequity

Interview	Supporting Evidence
P11	My job are, they help me as much as they can but it's when the likes of the league, say the game is cancelled and then a week later they say the game is the coming weekend on a Saturday. I have to go back to my job and say listen, the game is on the weekend, I need that day off. The league don't really help themselves in that aspect and obviously they only kind of release the fixtures. Like the men's got their fixtures a week after their season finished and we had to wait and wait and wait. That's another thing. How long does it take to do those fixtures?

P16	Even now if you went to say the likes of anyone in the FAI, they would be like oh everyone is equal. The women's sport and the men's sport, it's all equal. If you look at the funding, it's all different. The men get more than the women get.
P16	Probably it looks like they (Dublin women's Gaelic football team) have a full strength and conditioning coach. We have a physio but just say if we had training on a Friday and the men had training on a Friday. That physio goes with the men and not the women. It is like they have more resources. Obviously, we have training in XXXX now whereas it is a full astro and everything like that so that's fine but probably the Dublin women's team would… after they train, they are probably getting a hot meal. We get cereal and fruit which is provided by our kit man. He goes out and buys them like.
P2	Because you don't feel as equal even to them (men's League of Ireland clubs), but you are supposed to be the equal league but in women's like form so I think it plays a little factor yeah.
P3	I feel like men's teams are looked after first and foremost whereas if you look at other sports they are not a club team. It is like a county team if you know what I mean, it is like a representative team whereas we are still representing a team but a club, you have to… they get their gear quicker and it is there for them. I think they look after the men first and then they'll go alright we'll do the women's now.
P5	for example the women's senior (international) team having to basically go on strike to get very basic things. I'm sure they felt like a burden, they are trying to raise their concerns but they eventually, that was the right thing to do, was to speak up but sometimes you can feel like if we are constantly trying to… can we get that as well?, can we get that as well?, just to try and get the same as the men's that can feel a bit deflating and you feel like if you are just trying to get what equality is by having to talk about everything that you need to get constantly is a bit… you could be left feeling like a burden and that more of a hindrance more than anything else.