

Menstrual cycle, hormonal contraception and pregnancy in women's football: Perceptions of players, coaches and managers

Journal:	<i>Sport in Society</i>
Manuscript ID	FCSS-2022-0126.R2
Manuscript Type:	Original Article
Keywords:	Reflexive thematic analysis, Mixed methods, Ovarian hormones, Soccer, Postpartum

SCHOLARONE™
Manuscripts

Introduction

To grow and promote women's football, the Fédération Internationale de Football Association (FIFA) have developed a women's football strategy (Fédération Internationale de Football Association 2018). Included in this strategy has been the recent introduction of a regulatory framework for maternity protection (Fédération Internationale de Football Association 2020). Because of the infancy of these guidelines, how they are implemented is relatively unknown. Based on previous research, there may be substantial gaps in knowledge and beliefs among players and coaches about policies and practices pertinent to women footballers and participants (McKay et al. 2014; Culvin and Bowes 2021).

Physiological research on exercise and training in women's football does not parallel that conducted on men, although it is developing (Okholm Kryger et al. 2021). Across other sports, there is growing research on the effect of ovarian hormone variations that occur across the menstrual cycle and with hormone-based contraceptive use on training, performance and wellbeing (Elliott-Sale et al. 2020; McNulty et al. 2020). Variations in both exogenous and endogenous ovarian hormone levels occur across the lifespan, so understanding their effects are important for women's football to progress. For instance, performance may be optimized at certain phases of the menstrual cycle (McNulty et al. 2020; Oosthuysen and Bosch 2010). Training could be adapted in order to avoid injury (Martin et al. 2021), muscle soreness (Romero-Parra et al. 2021), training perturbations (Parker et al. 2021) and menstrual dysfunction (Prather et al. 2016). Hormone-based contraception may offer some protection against anterior-cruciate ligament injury (Herzberg et al. 2017). Yet, in a survey of Australian athletes, knowledge of menstrual cycle and hormone-based contraceptive use was low especially among team sport athletes (Larsen et al. 2020), which may be detrimental to the

1
2
3 performer (Brown, Knight, and Forrest 2020). Team sport coaches, principally men,
4
5 have been found to lack understanding about certain aspects of the menstrual cycle,
6
7 such as menstrual dysfunction (Kroshus et al. 2014), with issues reported regarding how
8
9 coaches communicate with athletes (Kroshus et al. 2014; Clarke, Govus, and Donaldson
10
11 2021). More research is, therefore, warranted on what is known about ovarian
12
13 hormones, how knowledge is applied in footballing practice, and how players and staff
14
15 are supported. A core component in disseminating such knowledge and raising
16
17 awareness of the effects of ovarian hormones on performance is through formalized
18
19 coach education structures. Hitherto, however, the topic of ovarian hormones and their
20
21 effects on training and performance, in addition to pregnancy and postpartum wellbeing,
22
23 seems to have received scant consideration within any formal coach education courses.
24
25 The purpose of this study was, therefore, to address this research lacuna by analysing
26
27 players', coaches' and managers' perceptions of policies and research on menstrual
28
29 cycle, hormonal contraception and pregnancy within six European countries (who are
30
31 member associations of FIFA).
32
33
34
35
36
37
38
39
40

41 **Methods**

42
43 The project employed an iterative mixed-methods' approach. The first iteration included
44
45 quantitative analysis of survey data by way of conducting content analysis of open-text
46
47 survey responses. Reflexive thematic analysis of focus group and interview data
48
49 comprized the second iteration of the study.
50
51

52 Eligibility criteria included adults (≥ 18 years) involved in women's football
53
54 (grassroots to elite) from Bulgaria, England, Finland, France, Poland and Spain. All
55
56 countries followed the same recruitment strategy, which included emails to women's
57
58 football teams and organizers, and through social and mass-media outlets. The number
59
60

1
2
3 of survey respondents (following exclusions due to being under 18 (n=3), not living in
4 one of the six countries (n=6), and not completing any question despite giving consent,
5 n=194) was 1127 (France, n=404; Finland, n=217; England, n=165; Poland n=120;
6 Spain n=115; Bulgaria, n=106). Nine focus groups with 21 participants and 40 one-to-
7 one interviews were conducted. Participants were informed about their right to
8 withdraw via informed consent. All work was approved by the lead institute's ethical
9 committee.

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Using Qualtrics software, the online survey was developed in English, then translated into each country's official language. Data were collected from 17th March to 30th June 2021. A five-point Likert scale was used to capture information on respondents' feelings, beliefs and perceived knowledge, and open-text responses were used to gather information on specific areas of good practice, areas for improvement and on respondents' awareness of policies. Additional questions were asked so that respondents could be described in terms of their role in and outside the club, hours spent in their role, level of play at their club and ratio of males to females at their club. Data on respondents' gender, age and country of residence were also captured.

Focus group participants were recruited from the initial survey and consisted of participants from the same country. If focus groups were inconvenient, individual interviews were conducted. All focus groups/interviews took place online between 7th June and 3rd December 2021. An open and flexible topic guide was used (Table 1), to account for different experiences. Survey responses were used in developing the topic guide to ensure questions were relevant.

Descriptive data from the surveys were expressed using percentages, frequency counts, mean and standard deviation (SD). Divergent stacked bar charts were used to represent Likert data (Heiberger and Robbins 2014). Open-text responses were

1
2
3 translated into English; content analysis was then used to quantify and analyse the
4
5 presence, meanings and relationships of words, topics and concepts, which were coded
6
7 and put into meaningful categories.
8
9

10 Focus group/interview data were transcribed verbatim, translated into English
11
12 and analysed using reflexive thematic analysis (Braun and Clarke 2019). Researchers
13
14 immersed themselves in the data, before generating codes and themes using NVivo 12
15
16 Pro. Codes/themes were revisited several times through researchers working
17
18 collaboratively and questioning the analysis (Smith and McGannon 2018). Theme
19
20 development was a reflexive and iterative process. An audit trail was kept to highlight
21
22 the discussions, reflections, processes and discrepancies (Nowell et al. 2017).
23
24 Participants were offered opportunities to conduct member checking of their transcripts
25
26 and of the research team's interpretation of their data for resonance, coherency and
27
28 credibility, so that the findings could make a meaningful substantive contribution in this
29
30 area (Tracy 2010). Quotes from the data were extracted to support themes and
31
32 subthemes.
33
34
35
36
37
38
39
40
41

42 **Results**

43 Survey respondents' mean age was 30.7 (SD=11.5) years, ranging from 18 to 71 years.
44
45 Further information about the respondents is given in Table 2. Based on Likert-style
46
47 responses, participants reported a lack of educational provision from clubs regarding
48
49 menstrual cycle (Figure 1), hormonal contraception (Figure 2) and
50
51 pregnancy/postpartum (Figure 3), although respondents felt confident talking about
52
53 such matters (Figures 1 to 3). Support for pregnancy was felt to be generally good
54
55 (Figure 3). Participants were slightly more knowledgeable about the effects of ovarian
56
57 hormones on health, in comparison to effects on training, performance and participation
58
59
60

(Figures 1 and 2). Only 4% (n=13) of respondents knew of club policies or guidance on menstrual cycle or hormonal contraception. Only 5% (n=13) knew of club policies on pregnancy, maternity leave, motherhood and caring responsibilities/childcare.

Details of focus group/interview participants are given in Table 3. Focus groups had between two and eight participants. Mean duration of focus groups/interviews was 34:20 (range 07:44 min: s to 01:41:00 hr: min: s). Based on the reflexive thematic analysis of the focus groups and interviews, as well as the content analysis of the open-text survey responses, Figure 4 depicts the one overarching theme of ‘aspects of support’ identified from the data. Two subthemes of ‘top-level intervention’ and ‘practical measures’ were encompassed within ‘aspects of support’. Three other lower-order themes of ‘understanding and knowledge’; ‘talking and discussion’ and ‘player decisions’ were identified that were found to be dependent on the type of ‘aspects of support’ offered based on the two subthemes.

To support and describe the themes for reporting purposes, participant codes were created. The codes denote country (B=Bulgaria, EN=England, F=Finland, FR=France, P=Poland and Spain=SP), followed by participant number (P1...P170), self-disclosed gender (F=Female, M=Male), role at the club (A=Administrator, C=Coach, M=Manager and P=Player), and whether data were from the survey=S, focus group=F or interview=I. For instance, a code of BP1FA-F denotes that the individual is from Bulgaria, is participant 1, is female, an administrator and was part of a focus group.

Aspects of support

This theme is central to the findings and acted as an overarching theme to all other sub-themes. It encompasses: ‘practical measures’ and ‘top-level intervention’. Practical

1
2
3 measures categorized the support available to players, and top-level intervention
4
5 considered aspects that were the responsibility of organisational management.
6
7
8

9 *Practical measures*

10 Some clubs tracked players' menstrual cycle, but this was varied and inconsistent.
11
12 Players from Bulgaria reported no tracking, and for some in Poland, it was the players'
13
14 responsibility. In contrast, other countries used a range of different methods to monitor
15
16 menstrual cycle, including the 'athlete monitoring programme' (FP36FC-F) in Finland,
17
18 'tracker apps' (ENP15FP-I) in England, and in Spain, players' weight was tracked,
19
20 'because if you are ovulating...you weigh more' (SPP6FP-F). Tracking menstrual cycle
21
22 often resulted in training adaptations. Information was used by French coaches to
23
24 'lighten the loads...according to the players' feelings' with players being 'excused from
25
26 training when they have severe pain' (FRP13FC-I). Players reported that they 'train
27
28 separately' (SPP5FP-F), or 'take it easy' (FP17FP-I). Conversely, other coaches
29
30 indicated that: 'It doesn't change anything. They always train, whether...in the cycle or
31
32 not' (PP3FC-I); 'nothing is going to be adapted' (FRP44FM-F); 'it's very much off the
33
34 agenda' (ENP29FC-I). A further comment from a manager was that 'when they [the
35
36 coaches] have a choice of a girl's health and her period...they always choose the result
37
38 and they definitely care more about winning the match than taking care of the girls'
39
40 health' (PP9FM-I), with a justification put forward as being, 'our trainer says that there
41
42 are 20 or 30 players, so in every training there would be a period, so he could not
43
44 implement the training plan' (PP9FM-I).
45
46
47
48
49
50
51

52 Although management noted tracking menstrual cycle was 'very important...
53
54 [due to] percentage of injuries... [when in] cycle' (SPP7MM-I), there were admissions
55
56 that 'club authorities don't interfere in such issues; it belongs to the coaches, but I know
57
58 from coaching practice that such topics are not discussed' (PP17MM-S). Players felt
59
60

1
2
3 they needed ‘good trust in the coach...to talk about these things’ (FP33FP-F) and
4
5 coaches tried to develop ‘quite a close relationship’ (ENP22MC-F) with players as they
6
7 were aware that ‘it's not always easy to say that you're having your period and
8
9 (would)...thank [players] for the trust...because it's a question of intimacy’ (FRP57FC-
10
11 I).

12
13
14 Some players supported each other rather than approaching their coaches
15
16 keeping it ‘between us girls...[we] sit and talk about it in training or before or after
17
18 games’ (ENP3FP-I) describing this support as ‘solidarity’ (PP8FP-I), with younger
19
20 players talking ‘to senior players to create a girl-to-women connection’ (FRP170MC-S).
21
22 Similarly, pregnant players or those returning from maternity were supported by other
23
24 players ‘who knew [about] maternity training and after pregnancy training’ (FP17FP-I)
25
26 and who ‘arranged [childcare]...between the team’ (FP40FC-I). A lack of available
27
28 support often meant pregnant players ‘avoid coming on the field’ (FRP44FM-F) and
29
30 ‘missed out on playing’ (FP36FC-F) but were still ‘part of the team through the whole
31
32 pregnancy... [by taking] a bigger role in the locker room’ (FP36FC-F).
33
34
35
36
37
38
39
40

41 *Top-level intervention*

42
43 There was a lack of support from top-level management with reports that ‘clubs don't
44
45 have the resources’ (FP33FP-F) and feelings that ‘it should be a standard part of coach
46
47 training’ (FP35MM-F). This would mean all coaches have the same information, which
48
49 would help if staff were to change clubs. Limited training was offered to coaches or
50
51 players, with clubs organising ‘lectures’ (FP33FP-F) and ‘snippet workshops’
52
53 (ENP31MC-I). Training courses were often reported to have ‘no content around
54
55 managing pregnancy’ (ENP31MC-I), and a lack of information on menstrual cycle and
56
57 performance: ‘It doesn't exist’ (SPP12FC-IF) or maybe a ‘token gesture’ (ENP31MC-I).
58
59
60

1
2
3 All countries recognized it would be ‘good practice’ (BP4FP-F) to have training, with
4 coaches acknowledging that: ‘increasing knowledge is infinitely important...what the
5 menstrual cycle is and what things it affects in performance...I'm definitely in favour of
6 some kind of training’ (FP36FC-F), which would ensure that what coaches tell players
7 is ‘correct’ (ENP41FA-I).

8
9
10 Countries reported a lack of club policy around pregnancy and maternity with
11 players and coaches ‘not aware of such a policy’ (BP4FP-F) or of ‘any support’
12 (FP17FP-I) provided. One female coach claimed:

13
14
15 it would be annoying...If a player comes to me and says, “I'm going to
16 have a child, I'll stop for a year”, I'll have a breakdown. I wouldn't
17 prevent it. I would be very annoyed because I would end up paying with
18 my very small budget for a player that I couldn't use (FRP13FC-I).

19
20
21 A manager felt that pregnancy would be something that ‘they would not know how to
22 handle’ and that ‘a guide of good practices’ (SPP8MM-F) would help. In some cases,
23 when female players were contracted, ambiguity was evident:

24
25
26 I don't even know if maternity leave is in my contract! So, I need to look
27 at this and definitely ask the question but I'm also worried, will I be
28 sacked and dismissed, will they wonder if I'm pregnant, will they think I
29 don't care about my career? (ENP28FP-S).

30
31
32 The lack of policy covering pregnancy, in addition to the absence of formal
33 employment contracts for players, resulted in ‘no maternity pay’ and the support a
34 player got was dependent ‘on the club...but there's definitely no financial support’
35 (ENP29FC-I). Some ‘clubs are even too poor...to pay their players [expenses] let alone
36 pay to people who become pregnant’ (PP2FP-I), saying ‘everything is money...the club
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 has to have financial support from the sponsors' (SPP4FP-F), and 'It wouldn't happen.
4
5 We struggle to get money back for referees, let alone support on anything else, and we
6
7 don't have a supportive committee' (ENP25FMC-S). Another issue affected by the
8
9 financial situation of clubs was the provision of childcare: 'I definitely don't think there
10
11 are any childcare facilities within the clubs...I don't think there's enough money'
12
13
14 (ENP39FP-F). One club in France wanted to support playing mothers:

15
16
17 My objective at the club this year is to set up a day-care centre...girls
18
19 should be able to come and train because it often happens that they can't
20
21 train because they don't have any childcare...but it has to be financially
22
23
24 feasible (FRP44FM-F).

30 ***Knowledge and understanding***

31
32 This lower-order theme examined the source and extent of current information around
33
34 menstrual cycle, hormonal contraception and pregnancy. Limited knowledge and
35
36 understanding were indicated. Of the 125 open-text survey comments on good practices
37
38 regarding the menstrual cycle and/or hormonal contraception, 70 comments were
39
40 categorized as 'not applicable/none/no opinion' such as 'nothing is done' (SP04FC-S)
41
42 and 'I have never thought about this' (FP18FP-S). The remaining 55 comments inferred
43
44 some knowledge and understanding, albeit vaguely: 'The information I know about the
45
46 influence of the menstrual cycle on my training loads is enough for me to work
47
48 adequately and appropriately!' (BP15FC-S). From interviews/focus groups, there was
49
50 some awareness in most countries of research into menstrual cycle and performance:
51
52 'It's important we have that knowledge and understanding' (ENP31MC-I). Despite
53
54 some evidence being available, however, research did not 'give the same opinions'
55
56
57 (FRP13FC-I), leaving participants feeling that the existing knowledge base was 'fairly
58
59
60

1
2
3 limited' (ENP1MA-I). Some participants suggested players were more 'susceptible to
4
5 knee injuries' (ENP1MA-I) and might feel an increase in 'stamina' (SPP6FP-F) during
6
7 the luteal phase of their cycle. Knowledge was gained independently through the
8
9 'internet' (FP17FP-I), 'podcasts' (FRP44FM-F), 'webinars' (ENP29FC-I), or 'lectures'
10
11 (FP36FC-F). One coach felt players were 'embarrass[ed]...about these subjects'
12
13 (FRP13FC-I), whereas others felt there is 'more talk [and]...acceptance to it'
14
15 (ENP39FP-F). A player commented that their club had improved 'over the last few
16
17 years' (ENP15FP-I). Many clubs had not directly 'come across pregnancy' (ENP31MC-
18
19 I) and therefore had 'no opinion' (PP2FP-I), although it was hoped that changes in the
20
21 future would allow players to return after maternity. Indeed, this inferred to another
22
23 lower-order theme of 'player decisions' which the next section details (see the theme on
24
25 player decisions).

32 33 34 ***Talking and discussion***

35
36 This lower-order theme examined the openness and willingness of information sharing
37
38 between coaches and players. From the survey, improving practices relating to
39
40 menstrual cycle and hormonal contraception yielded 183 codes across 16 categories.
41
42 The most prevalent categories were 'open dialogue' (n=43; e.g., 'the more it is talked
43
44 about and normalized, the more it will improve' ENP06FP-S), 'formal education/expert
45
46 speaker' (n=47; e.g., 'Possible conducting of lectures by specialists in the field'
47
48 BP15FC-S), and 'group classes' (n=11; e.g., 'conducting some information sessions'
49
50 SPP03FP-S). From interviews/focus groups, contraception discussions were rare as
51
52 'even though our doctor strongly encourages [it], we have very few requests'
53
54 (FRP13FC-I). One club referred to contraception as 'medication to control their cycle'
55
56 to 'reduce...the taboo' (SPP8MM-F). The menstrual cycle was not 'generally talked
57
58
59
60

1
2
3 about' (PP5FP-I), with evidence of players 'dealing with it on my own' (BP4FP-F),
4
5 'respecting each player's way of dealing with it' (SP104MC-S), because of clubs not
6
7 'giving any information' (FP17FP-I). One coach commented: 'Firstly, I need to be
8
9 comfortable with it. Secondly, it needs to be addressed, but before that, there needs to
10
11 be clear knowledge and understanding' (ENP28FC-S). Managers and coaches felt that
12
13 'it's a great pity that we don't talk about it' (FRP44FM-S); 'it is a topic that is a little bit
14
15 overlooked...we coaches are totally lost...in my career they did not talk to me about
16
17 this, nothing. It is a taboo subject for everybody; the menstrual period does not exist'
18
19 (SPP12FC-F).
20
21
22
23

24 Approaching coaches about menstrual cycle was difficult for some players. One
25
26 barrier identified was that 'the female game is still predominantly coached by males'
27
28 and that 'males won't understand...how she feels physically to go through the cycle'
29
30 (ENP29FC-I) with players feeling that 'there is no way I can discuss such things...he is
31
32 a man' (BP14FP-I). This finding was supported by male coaches, 'they don't tell me'
33
34 (SPP9MC-F). Tracking menstrual cycle through an app (see subtheme on practical
35
36 measures) avoided the need to communicate: 'It's just great in the sense that there's no
37
38 need to communicate. However, information is transmitted through it' (FP41FP-I).
39
40 Conversely, a small proportion of players and managers, felt 'no shame...[to] tell the
41
42 coach' (PP5FP-I), 'it is not a taboo subject' (PP6FM-I), allowing players to talk openly
43
44 'like it is not taboo, it's kind of an understandable thing' (FP37MC-F).
45
46
47
48

49 Clubs felt that a trusting relationship with the coach would 'give [players]
50
51 that...opportunity to raise it [menstrual cycle] with us...so they are not hiding anything'
52
53 (ENP40MM-F). However, 'there are those who tell you and those who do not; it is
54
55 [down to the] privacy of the person' (SPP7MM-F). Some felt male coaches might find it
56
57 difficult educating players on the menstrual cycle due to their lack of personal
58
59
60

1
2
3 experience: 'Increasing female coaches [is] important; they have a better understanding'
4 (FP35MM-F). This approach was adopted in Finland where they 'emphasized female
5 coaching because it's probably easier to talk about these things to a woman' (FP37MC-
6 F) and an England manager decided 'to have a woman...assistant manager so if they
7 don't feel comfortable coming to me, they've still got that way to explain it'
8 (ENP40MM-F). A French coach indicated that changes were being made to increase
9 female medical staff to reduce 'embarrassment' as 'certain countries or...religions'
10 found a male 'disturbing' (FRP13FC-I). This links to the 'top-level intervention'
11 subtheme.
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

29 *Player decisions*

30 This lower-order theme looked at players' choices and reasons around starting a family.
31 The dual role of parenting/playing was challenging for players because 'with the current
32 support network that is in place in women's football, I just don't see it being a
33 possibility' (ENP29FC-I). It was felt that: 'women do suffer...some of them are great
34 players...that fall away from the game because they simply haven't got that support
35 mechanism at home to carry on' (ENP40MM-F). There were reports of players
36 returning after children, with some players 'very successful' (FR913FC), but for others,
37 returning after children was 'not compatible at all' (FRP13FC-I), because 'there was no
38 support' (PP3FC-I), although many had no direct experience. There was also a
39 comment about how role models from professional football might ease the transition
40 back into play following pregnancy:
41
42
43
44
45
46
47
48
49
50
51
52
53
54

55 We can see that some female football stars choose to have a child during
56 their career. So, I think it will be good for girls at our level to say to
57
58
59
60

1
2
3 themselves, “Well, we can, even if we obviously don't have the same
4 means...we can interrupt our training for a year or a year and a half to
5 have a child and then come back... it's not impossible” ...I think that's a
6
7
8
9
10 very positive thing. (FRP56FP-I).
11
12
13

14 Returning players ‘struggled a little bit...we're at that level now where if you start to
15 struggle you tend to fall behind’ (ENP15FP-I). This difficulty of re-training the body
16 after pregnancy was acknowledged, even though the motivation to return to play was
17 there: ‘There is this fear [of not] ...going to be able to come back, if the body is going
18 to be able to follow, even if, in the head, we really want to’ (FP41FP-I). Nevertheless, ‘a
19 lot of people do give up playing...because you know they're talking about childcare’
20 (ENP2FA-I). Across countries, finances were a common barrier to returning after
21 pregnancy: ‘very few women return...because they need a fixed salary to pay child
22 support’ (BP1FC-I). It was not seen as the ‘custom in...France’ to return from
23 maternity: ‘It's not forbidden, but it's not something that's done. You don't stop playing
24 for a year to have a child’ (FRP13FC-I). In England, ‘there probably are...handfuls of
25 players that are parents...and then come back into the game...it's just not hugely
26 supported; it's not that common’ (ENP41FA-I). In addition, childcare issues caused
27 problems for coaches when trying to organize teams since ‘it's knowing who's playing
28 when and at what time, who's leaving and how we can organize ourselves. Is your
29 spouse there, can he take the children?’ (FRP57FC-I).
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54

55 Discussion

56
57 Football players’, coaches’ and managers’ perceptions of policies and information on
58 menstrual cycle, hormonal contraception and pregnancy from six European countries
59
60

1
2
3 were explored via survey and interview/focus group, ~~owing to the lack of research in~~
4 ~~this area~~. Despite some good practices in individual clubs across different countries,
5
6 there was limited perceived knowledge and understanding of how training, performance
7
8 and health are affected, as has been found previously (Larsen et al. 2020; Brown,
9
10 Knight, and Forrest 2020; Höök et al. 2021; Statham 2020), which may prevent athletes
11
12 and coaches initiating discussions (Höök et al. 2021). Knowledge was generally left up
13
14 to the individual without support from governing bodies or coach education providers.
15
16 A need for more knowledge about the interrelation between ovarian hormones and
17
18 exercise has been reported in previous research (Brown, Knight, and Forrest 2020;
19
20 Clarke, Govus, and Donaldson 2021; Höök et al. 2021; Solli et al. 2020; Verhoef et al.
21
22 2021). A consistent, top-level approach was called for.
23
24
25
26
27

28
29 There appeared to be slightly more perceived knowledge on how injury may be
30
31 affected by ovarian hormone variation. There is, though, so much more than injury that
32
33 could be taught about ovarian hormone effects, such as menstrual dysfunction (Moss et
34
35 al. 2020), performance variations (McNulty et al. 2020; Elliott-Sale et al. 2020), and
36
37 how negative symptoms associated with the menstrual cycle and hormonal
38
39 contraceptive use could lead to footballers missing training (Parker et al. 2021). Such
40
41 in-depth knowledge is needed to support female footballers, so that training can be
42
43 adapted. There are, however, ambiguities in the research (McNulty et al. 2020; Elliott-
44
45 Sale et al. 2020), as was inferred in the current study, especially within football-specific
46
47 research (Julian et al. 2020), which may prevent changes from being implemented. If
48
49 women are considered as a team, then differences due to individual hormonal variations
50
51 are not likely to be discerned (Randell et al. 2021). But even in team sports, individually
52
53 tracking the menstrual cycle could be a first step in identifying hormonal-related effects
54
55 on performance and training. Menstrual cycle tracking apps have been suggested to
56
57
58
59
60

1
2
3 increase body awareness, improve menstrual cycle knowledge and understanding, and
4 empower the user (Levy and Romo-Avilés 2019). In the current study, use of apps and
5 menstrual cycle tracking was inconsistent, and, as has been identified in the literature
6 (Levy and Romo-Avilés 2019), there were issues expressed regarding if and how the
7 data were used. Individual monitoring could, however, improve health and performance
8 literacy and, as identified in the current study, facilitate conversation for improved
9 performance outcomes. Subsequently, the inclusion of this topic within the provision of
10 formal coach education could act as a mechanism to introduce coaches to the
11 importance of this topic. In turn, methods such as menstrual cycle tracking apps could
12 provide coaches with specific strategies to consider and approach their players and
13 participants on this subject.

14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Instigating discussions during coach education courses could mitigate the issue that, in some countries, talking about menstrual cycle and hormonal contraception was seen as taboo, consistent with previous research (Verhoef et al. 2021; Solli et al. 2020). Open dialogue between the coach and footballer was dependent on the gender of the coach, the topic's perceived relevance and on trust, supporting previous findings (Brown, Knight, and Forrest 2020; Solli et al. 2020; de Haan and Norman 2020; Findlay et al. 2020; Höök et al. 2021; Pavlidis 2020). Although having a woman coach with whom to talk was perceived as being preferable by participants in the current study, female coaches' knowledge of the menstrual cycle may be limited, as well as being based on the coaches' own or on their athletes' menstrual cycle experiences (Brown and Knight 2022). Open dialogue may, however, be engendered through hiring more women coaches and increasing coach knowledge, as suggested by study participants.

The extent of support for pregnancy and childcare seemed to be dependent on money and club resources from 'the top', solidarity between club members and support

1
2
3 at home. Role models were perceived to influence a player's decision to start a family.
4
5 There is very little research specific to football and pregnancy (Martínez-Lagunas,
6
7 Niessen, and Hartmann 2014), and the number of professional footballers who are
8
9 mothers is extremely low (Koukiadaki and Pearson 2017). Motherhood for the athlete is
10
11 often career ending (Tekavc, Wylleman, and Cecić Erpič 2020; Palmer and Leberman
12
13 2009), possibly owing to traditional gendered ideologies of parenting roles (Mazerolle
14
15 and Eason 2015; Appleby and Fisher 2009). The majority of professional women
16
17 footballers have been found to be unsure of their contractual agreement regarding
18
19 maternity and childcare support, yet were found not to question this normalized
20
21 irregularity for fear of compromising their player status (Culvin and Bowes 2021). In
22
23 the current study the lack of policy and financial support was concerning for players.
24
25 Unique to the current research, there was a club solidarity to pull together to support
26
27 each other through pregnancy, motherhood and menstrual-related issues, which was
28
29 necessitated by the lack of top-level intervention. Again, the data indicated how these
30
31 topics were underserved within the general discourse of women's football, including the
32
33 provision of its formal coach education. Including some content on women's
34
35 physiology can improve coaches' awareness, knowledge and understanding of these
36
37 issues. Covering such topics can, therefore, act as a springboard for coaches and other
38
39 support staff associated to women's football to engage in more dialogue to better
40
41 support all women athletes for improved performance outcomes or retention of
42
43 participation rates.
44
45
46
47
48
49

50
51 Regarding limitations of the study, participation was voluntary, which might
52
53 have led to bias in the sample, with participants, for instance, being more willing to
54
55 discuss topics. Owing to the range of participants that were recruited, which included
56
57 footballers, coaches, managers and support staff from grassroots to elite level, topics
58
59
60

1
2
3 were potentially diluted, but this was felt also to be a strength because of the variety of
4 viewpoints. A further strength of the study was that the interviews/focus groups added
5 depth and richness to the quantitative data, allowing clear take-home messages to be
6 generated, such as the need for a top-level, consistent approach to disseminating
7 research-informed and policy-driven practice to improve understanding and dialogue
8 about the menstrual cycle, hormonal contraception and pregnancy.
9
10
11
12
13
14
15
16
17
18
19
20

21 ***Conclusion***

22 The menstrual cycle, hormonal contraception and pregnancy impact a
23 footballer's biological status, affecting perceived health, training and performance
24 (Prather et al. 2016; Parker et al. 2021; Culvin and Bowes 2021). In sport, these topics
25 also come with varying degrees of stigma and silence, as well as being a barrier to
26 gender equality (de Haan and Norman 2020; Brown, Knight, and Forrest 2020). Based
27 on the findings of the current study, women's football needs more educated women
28 coaches, as well as consistent content regarding the interplay between ovarian hormones
29 and football performance for coaches, so that there is open, unambiguous dialogue
30 between the coach and athlete. Such dialogue may go towards improving the health,
31 wellbeing and social development of the footballer, which goes beyond simply a policy
32 on women's welfare during pregnancy. Findings from the current study emphasized the
33 priority afforded to individual players acquiring information on these topics. There was
34 an absence of provision from national/international governing bodies concerning policy,
35 guidelines and the provision of coach education to stimulate greater dialogue. Without
36 open dialogue and without financial investment, women footballers may feel that they
37 need to keep pulling together to support each other through choices regarding menstrual
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 cycle effects, hormonal contraceptive use, pregnancy and childcare, which may lead to
4
5 misinformation being dispersed between players.
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review Only

References

- 1
2
3
4
5 Appleby, Karen M., and Leslie A. Fisher. 2009. “‘Running in and out of Motherhood’:
6
7 Elite Distance Runners’ Experiences of Returning to Competition after
8
9 Pregnancy.” *Women in Sport and Physical Activity Journal* 18 (1): 3–17.
10
11 <https://doi.org/10.1123/WSPAJ.18.1.3>.
12
13
14 Braun, Virginia, and Victoria Clarke. 2019. “Reflecting on Reflexive Thematic
15
16 Analysis.” *Qualitative Research in Sport, Exercise and Health* 11 (4): 589–97.
17
18 <https://doi.org/10.1080/2159676X.2019.1628806>.
19
20
21 Brown, Natalie, Camilla J. Knight, and Laura J. Forrest. 2020. “Elite Female Athletes’
22
23 Experiences and Perceptions of the Menstrual Cycle on Training and Sport
24
25 Performance.” *Scandinavian Journal of Medicine and Science in Sports*.
26
27 <https://doi.org/10.1111/sms.13818>.
28
29
30 Brown, Natalie, and Camilla J Knight. 2022. “Understanding Female Coaches’ and
31
32 Practitioners’ Experience and Support Provision in Relation to the Menstrual
33
34 Cycle.” *International Journal of Sports Science & Coaching* 17 (2): 235–43.
35
36 <https://doi.org/10.1177/17479541211058579>.
37
38
39 Clarke, Anthea, Andrew Govus, and Alex Donaldson. 2021. “What Male Coaches Want
40
41 to Know about the Menstrual Cycle in Women’s Team Sports: Performance,
42
43 Health, and Communication.” *International Journal of Sports Science & Coaching*
44
45 16 (3): 544–53. <https://doi.org/10.1177/1747954121989237>.
46
47
48 Culvin, Alex, and Ali Bowes. 2021. “The Incompatibility of Motherhood and
49
50 Professional Women’s Football in England.” *Frontiers in Sports and Active Living*
51
52 0 (September): 267. <https://doi.org/10.3389/FSPOR.2021.730151>.
53
54
55 Elliott-Sale, Kirsty J., Kelly L. McNulty, Paul Ansdell, Stuart Goodall, Kirsty M. Hicks,
56
57 Kevin Thomas, Paul A. Swinton, and Eimear Dolan. 2020. “The Effects of Oral
58
59 Contraceptives on Exercise Performance in Women: A Systematic Review and
60

1
2
3 Meta-Analysis.” *Sports Medicine* 50 (10): 1785–1812.

4
5 <https://doi.org/10.1007/s40279-020-01317-5>.

6
7 Fédération Internationale de Football Association. 2018. “Women’s Football Strategy.”

8
9 2018.

10
11 [https://digitalhub.fifa.com/m/baafcb84f1b54a8/original/z7w21ghir8jb9tguvbcq-](https://digitalhub.fifa.com/m/baafcb84f1b54a8/original/z7w21ghir8jb9tguvbcq-pdf.pdf)
12
13 [pdf.pdf](https://digitalhub.fifa.com/m/baafcb84f1b54a8/original/z7w21ghir8jb9tguvbcq-pdf.pdf).

14
15
16 ———. 2020. “Women’s Football: Minimum Labour Conditions for Players.” 2020.

17
18 <https://digitalhub.fifa.com/m/033101649cc3c480/original/f9cc8eex7qligvxfznbfpdf.pdf>.

19
20
21 Findlay, Rebekka J., Eilidh H.R. MacRae, Ian Y. Whyte, Chris Easton, and Laura J.

22
23 Forrester. 2020. “How the Menstrual Cycle and Menstruation Affect Sporting

24
25 Performance: Experiences and Perceptions of Elite Female Rugby Players.” *British*

26
27 *Journal of Sports Medicine* 54 (18): 1108–13. [https://doi.org/10.1136/bjsports-](https://doi.org/10.1136/bjsports-2019-101486)

28
29
30
31
32
33 2019-101486.

34
35 Haan, Donna de, and Leanne Norman. 2020. “Mind the Gap: The Presence of Capital

36
37 and Power in the Female Athlete–Male -Coach Relationship within Elite Rowing.”

38
39 *Sports Coaching Review* 9 (1): 95–118.

40
41 <https://doi.org/10.1080/21640629.2019.1567160>.

42
43
44 Heiberger, Richard M., and Naomi B. Robbins. 2014. “Design of Diverging Stacked

45
46 Bar Charts for Likert Scales and Other Applications.” *Journal of Statistical*

47
48 *Software* 57 (5): 1–32. <https://doi.org/10.18637/JSS.V057.I05>.

49
50
51 Herzberg, Simone D., Makalapua L. Motu’apuaka, William Lambert, Rongwei Fu,

52
53 Jacqueline Brady, and Jeanne-Marie Guise. 2017. “The Effect of Menstrual Cycle

54
55 and Contraceptives on ACL Injuries and Laxity: A Systematic Review and Meta-

56
57
58
59
60 Analysis.” *Orthopaedic Journal of Sports Medicine* 5 (7): 232596711771878.

1
2
3 <https://doi.org/10.1177/2325967117718781>.

4
5 Höök, Martina, Max Bergström, Stig Arve Sæther, and Kerry McGawley. 2021. “Do
6 Elite Sport First, Get Your Period Back Later.” Are Barriers to Communication
7 Hindering Female Athletes?” *International Journal of Environmental Research*
8 *and Public Health* 18 (22): 12075. <https://doi.org/10.3390/IJERPH182212075>.

9
10 Julian, Ross, Sabrina Skorski, Anne Hecksteden, Christina Pfeifer, Paul S. Bradley,
11 Emiel Schulze, and Tim Meyer. 2020. “Menstrual Cycle Phase and Elite Female
12 Soccer Match-Play: Influence on Various Physical Performance Outputs.” *Science*
13 *and Medicine in Football*. <https://doi.org/10.1080/24733938.2020.1802057>.

14
15 Koukiadaki, A., and G. Pearson. 2017. “2017 FIFPRO Global Employment Report:
16 Working Conditions in Professional Women’s Football.”
17 <http://man.ac.uk/04Y6Bo>].

18
19 Kroshus, Emily, Roberta T. Sherman, Ron A. Thompson, Karen Sossin, and S. Bryn
20 Austin. 2014. “Gender Differences in High School Coaches’ Knowledge,
21 Attitudes, and Communication about the Female Athlete Triad.” *Eating Disorders*
22 22 (3): 193–208. <https://doi.org/10.1080/10640266.2013.874827>.

23
24 Larsen, Brianna, Kirstin Morris, Karlee Quinn, Mark Osborne, and Clare Minahan.
25
26 2020. “Practice Does Not Make Perfect: A Brief View of Athletes’ Knowledge on
27 the Menstrual Cycle and Oral Contraceptives.” *Journal of Science and Medicine in*
28 *Sport* 23 (8): 690–94. <https://doi.org/10.1016/j.jsams.2020.02.003>.

29
30 Levy, Johanna, and Nuria Romo-Avilés. 2019. “‘A Good Little Tool to Get to Know
31 Yourself a Bit Better’: A Qualitative Study on Users’ Experiences of App-
32 Supported Menstrual Tracking in Europe.” *BMC Public Health* 19 (1): 1–11.
33 <https://doi.org/10.1186/S12889-019-7549-8/TABLES/1>.

34
35 Martin, D, Kate Timmins, Charlotte Cowie, Jon Alty, Ritan Mehta, Alicia Tang, and Ian
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

- 1
2
3 Varley. 2021. "Injury Incidence across the Menstrual Cycle in International
4 Footballers." *Frontiers in Sports and Active Living* 3 (March): 616999.
5
6 <https://doi.org/10.3389/fspor.2021.616999>.
7
8
9
10 Martínez-Lagunas, Vanessa, Margot Niessen, and Ulrich Hartmann. 2014. "Women's
11 Football: Player Characteristics and Demands of the Game." *Journal of Sport and*
12 *Health Science* 3 (4): 258–72. <https://doi.org/10.1016/J.JSHS.2014.10.001>.
13
14
15
16 Mazerolle, Stephanie M., and Christianne M. Eason. 2015. "Perceptions of National
17 Collegiate Athletic Association Division I Female Athletic Trainers on
18 Motherhood and Work-Life Balance: Individual- and Sociocultural-Level Factors."
19 *Undefined* 50 (8): 854–61. <https://doi.org/10.4085/1062-6050-50.5.02>.
20
21
22
23
24
25
26 McKay, Carly D, Kathrin Steffen, Maria Romiti, Caroline F Finch, and Carolyn A
27 Emery. 2014. "The Effect of Coach and Player Injury Knowledge, Attitudes and
28 Beliefs on Adherence to the FIFA 11+ Programme in Female Youth Soccer."
29 *British Journal of Sports Medicine* 48 (17): 1281–86.
30
31 <https://doi.org/10.1136/BJSPORTS-2014-093543>.
32
33
34
35
36
37
38 McNulty, Kelly Lee, Kirsty Jayne Elliott-Sale, Eimear Dolan, Paul Alan Swinton, Paul
39 Ansdell, Stuart Goodall, Kevin Thomas, and Kirsty Marie Hicks. 2020. "The
40 Effects of Menstrual Cycle Phase on Exercise Performance in Eumenorrhic
41 Women: A Systematic Review and Meta-Analysis." *Sports Medicine* 50 (10):
42 1813–27. <https://doi.org/10.1007/s40279-020-01319-3>.
43
44
45
46
47
48
49 Moss, Samantha L., Rebecca K. Randell, Darren Burgess, Stephanie Ridley, Caibre
50 ÓCairealláin, Richard Allison, and Ian Rollo. 2020. "Assessment of Energy
51 Availability and Associated Risk Factors in Professional Female Soccer Players."
52 *European Journal of Sport Science*, 1–27.
53
54 <https://doi.org/10.1080/17461391.2020.1788647>.
55
56
57
58
59
60

- 1
2
3 Nowell, Lorelli S., Jill M. Norris, Deborah E. White, and Nancy J. Moules. 2017.
4
5 “Thematic Analysis.” *International Journal of Qualitative Methods* 16 (1):
6
7 160940691773384. <https://doi.org/10.1177/1609406917733847>.
8
9
10 Okholm Kryger, Katrine, Albert Wang, Ritan Mehta, Franco M. Impellizzeri, Andrew
11
12 Massey, and Alan McCall. 2021. “Research on Women’s Football: A Scoping
13
14 Review.” *Science and Medicine in Football*, January, 1–10.
15
16 <https://doi.org/10.1080/24733938.2020.1868560>.
17
18
19 Oosthuysen, Tanja, and Andrew N. Bosch. 2010. “The Effect of the Menstrual Cycle on
20
21 Exercise Metabolism: Implications for Exercise Performance in Eumenorrhoeic
22
23 Women.” *Sports Medicine* 40 (3): 207–27. [https://doi.org/10.2165/11317090-](https://doi.org/10.2165/11317090-000000000-00000)
24
25 [000000000-00000](https://doi.org/10.2165/11317090-000000000-00000).
26
27
28 Palmer, Farah R., and Sarah I. Leberman. 2009. “Elite Athletes as Mothers: Managing
29
30 Multiple Identities.” *Sport Management Review* 12 (4): 241–54.
31
32 <https://doi.org/10.1016/j.smr.2009.03.001>.
33
34
35 Parker, Lloyd J., Kirsty J. Elliott-Sale, Marcus P. Hannon, James P. Morton, and
36
37 Graeme L. Close. 2021. “An Audit of Hormonal Contraceptive Use in Women’s
38
39 Super League Soccer Players; Implications on Symptomology.” *Science and*
40
41 *Medicine in Football*, May, 1–6. <https://doi.org/10.1080/24733938.2021.1921248>.
42
43
44 Pavlidis, Adele. 2020. “Being Grateful: Materialising ‘Success’ in Women’s Contact
45
46 Sport.” *Emotion, Space and Society* 35 (May): 100673.
47
48 <https://doi.org/10.1016/J.EMOSPA.2020.100673>.
49
50
51 Prather, Heidi, Devyani Hunt, Kathryn McKeon, Scott Simpson, E. Blair Meyer, Ted
52
53 Yemm, and Robert Brophy. 2016. “Are Elite Female Soccer Athletes at Risk for
54
55 Disordered Eating Attitudes, Menstrual Dysfunction, and Stress Fractures?”
56
57 *Physical Medicine and Rehabilitation* 8 (3): 208–13.
58
59
60

1
2
3 <https://doi.org/10.1016/j.pmrj.2015.07.003>.

4
5 Randell, Rebecca K., Thomas Clifford, Barry Drust, Samantha L. Moss, Viswanath B.

6
7 Unnithan, Mark B. A. De Ste Croix, Naomi Datson, et al. 2021. "Physiological

8
9 Characteristics of Female Soccer Players and Health and Performance

10
11 Considerations: A Narrative Review." *Sports Medicine*, April, 1–23.

12
13 <https://doi.org/10.1007/s40279-021-01458-1>.

14
15 Romero-Parra, Nuria, Rocío Cupeiro, Victor M. Alfaro-Magallanes, Beatriz Rael,

16
17 Jacobo Á. Rubio-Arias, Ana B. Peinado, and Pedro J. Benito. 2021. "Exercise-

18
19 Induced Muscle Damage during the Menstrual Cycle: A Systematic Review and

20
21 Meta-Analysis." *Journal of Strength and Conditioning Research* 35 (2): 549–61.

22
23 <https://doi.org/10.1519/JSC.0000000000003878>.

24
25 Smith, Brett, and Kerry R. McGannon. 2018. "Developing Rigor in Qualitative

26
27 Research: Problems and Opportunities within Sport and Exercise Psychology."

28
29 *International Review of Sport and Exercise Psychology* 11 (1): 101–21.

30
31 <https://doi.org/10.1080/1750984X.2017.1317357>.

32
33 Smith, Brett, and Andrew C. Sparkes, eds. 2016. *Routledge Handbook of Qualitative*

34
35 *Research in Sport and Exercise*. Routledge.

36
37 <https://doi.org/10.4324/9781315762012>.

38
39 Solli, Guro S., Silvana B. Sandbakk, Dionne A. Noordhof, Johanna K. Ihalainen, and

40
41 Øyvind Sandbakk. 2020. "Changes in Self-Reported Physical Fitness,

42
43 Performance, and Side Effects across the Phases of the Menstrual Cycle among

44
45 Competitive Endurance Athletes." *International Journal of Sports Physiology and*

46
47 *Performance* 15 (9): 1324–33. <https://doi.org/10.1123/IJSPP.2019-0616>.

48
49 Statham, Georgia. 2020. "Understanding the Effects of the Menstrual Cycle on Training

50
51 and Performance in Elite Athletes: A Preliminary Study." *Progress in Brain*

52
53
54
55
56
57
58
59
60

1
2
3 *Research* 253 (January): 25–58. <https://doi.org/10.1016/BS.PBR.2020.05.028>.

4
5 Tekavc, J., P. Wylleman, and S. Cecić Erpič. 2020. “Becoming a Mother-Athlete:
6
7
8 Female Athletes’ Transition to Motherhood in Slovenia.” *Sport in Society* 23 (4):
9
10 734–50. <https://doi.org/10.1080/17430437.2020.1720200>.

11
12 Tracy, Sarah J. 2010. “Qualitative Quality: Eight ‘Big-Tent’ Criteria for Excellent
13
14
15 Qualitative Research.” *Qualitative Inquiry* 16 (10): 837–51.
16
17 <https://doi.org/10.1177/1077800410383121>.

18
19 Verhoef, Saskia J., Merel C. Wielink, Edwin A. Achterberg, Marlies Y. Bongers, and
20
21 Simone M. T. A. Goossens. 2021. “Absence of Menstruation in Female Athletes:
22
23
24 Why They Do Not Seek Help.” *BMC Sports Science, Medicine and Rehabilitation*
25
26 2021 13:1 13 (1): 1–11. <https://doi.org/10.1186/S13102-021-00372-3>.

Table 1. Topic guide.

Included topics (Questions were adapted to explore any comments made)

Perceptions and good practices relating to the menstrual cycle and hormone-based contraception

Prompts or follow up questions

- How much do you know about these hormone-dependent changes that affect performance, training, and health? Why/why not is knowledge needed? How is knowledge obtained?
- Are modifications made? Explain.
- *For coaches/trainers*, what information is covered in courses?

Perceptions and good practices relating to pregnancy, maternity leave, childcare, multiple-role conflict in women's football

Prompts or follow up questions

- Policies?
 - *For coaches/trainers*, what is covered in courses on the effect of pregnancy and the postpartum period on training and performance?
-

Table 1. Gender, role and club status of survey respondents

Characteristic		n (percentage)
Gender	Female	358 (76%)
	Male	108 (23%)
	Non-binary/prefer not to say	3 (1%)
Role at current club	Footballer	505 (52%)
	Coach	230 (23%)
	Manager/leader	108 (11%)
	Administrator	79 (8%)
	Other (e.g., sport psychologist, sport scientist, referee/line official)	60 (6%)
Level of play at current club	Amateur	502 (64%)
	Semi-professional	52 (7%)
	Professional/elite	103 (13%)
	Junior	131 (16%)
Women: men ratio at current club	Women only	226 (28%)
	Significantly more women than men	88 (11%)
	About equal ratio	119 (14%)
	Significantly more men than women	382 (47%)

N.B. Not all surveys were completed in full as some respondents left questions blank, typically the open-text boxes, resulting in only 44% of respondents writing an answer to every question.

Table 3: Participant characteristics of focus group/interview participants according to role and country.

<i>Role</i>	Country						Total
	Bulgaria	England	Finland	France	Poland	Spain	
<i>Player</i>	4	3	5	5	6	3	26
<i>Coach</i>	4	3	3	3	1	3	17
<i>Gender</i>	4 F, 0 M	1 F, 2 M	2 F, 1 M	3 F, 0 M	1 F, 0 M	1 F, 2 M	12 F, 5 M
<i>Manager</i>	0	2	2	3	3	3	13
<i>Gender</i>		1 F, 1 M	1 F, 1 M	2 F, 1 M	3 F, 0 M	0 F, 3 M	7 F, 6 M
<i>Administrator</i>	1	3	0	0	0	0	4
<i>Gender</i>	1 F, 0 M	2 F, 1 M					3 F, 1 M
<i>Referee</i>	1	0	0	0	0	0	1
<i>Gender</i>	1 F, 0 M						1 F, 0 M
Total	10	11	10	11	10	9	61
Gender	10 F, 0 M	7 F, 4 M	8 F, 2=M	10 F, 1 M	10 F, 0 M	4 F, 5 M	49 F, 12 M

F=Female, M=Male. All players were female.

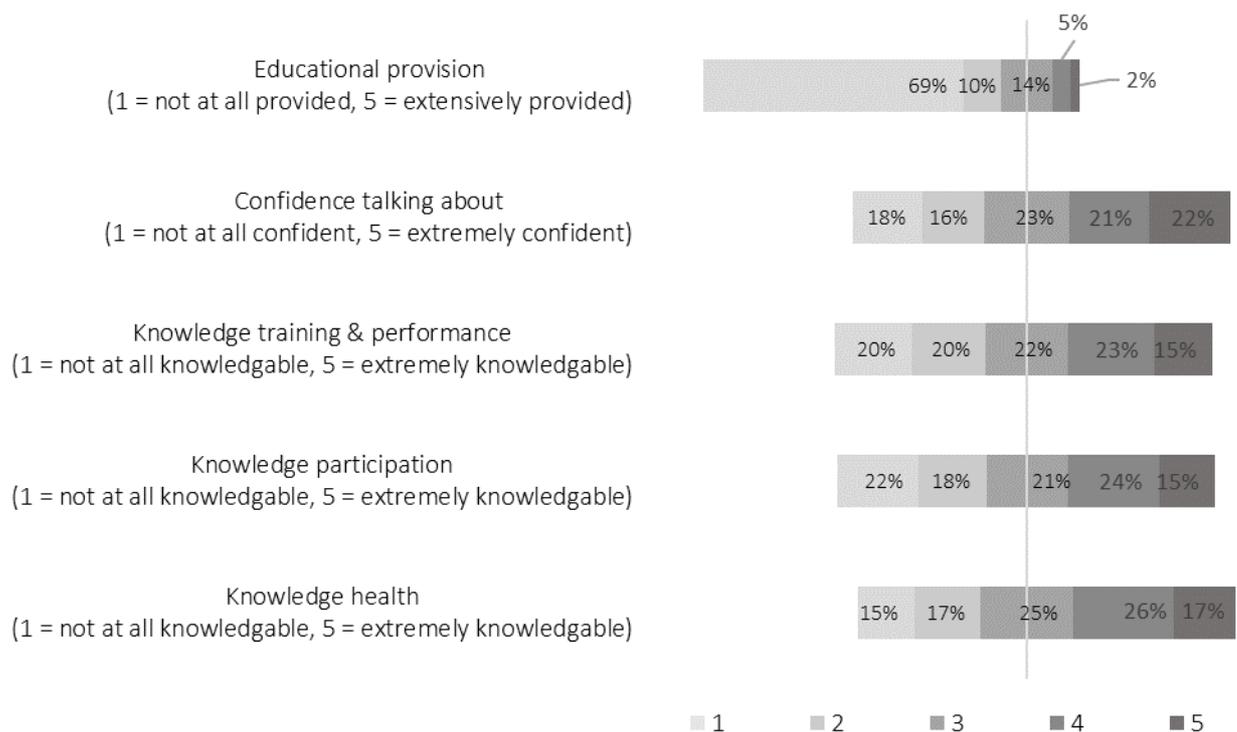


Figure 1. Likert responses, from all survey respondents, on menstrual cycle. Participants were asked about the extent to which education was provided about menstrual cycle at their club, how confident they felt talking about it, and on how knowledgeable they felt about how menstrual cycle might affect training and performance, participation and health. The vertical line in the centre of the chart centres the neutral responses in the middle so that categories can be compared; hence, it can be shown which factor has the most positive responses and which the most negative responses. Likert responses 1 and 2 diverge from the neutral '3' to the left and the Likert responses 4 and 5 diverge from the neutral to the right.

Alt text: A divergent stacked bar chart is shown in greyscale, which indicates how 'educational provision' about the menstrual cycle was not perceived to be well provided at participants' clubs, with 69% of all participants saying that educational provision on menstrual cycle was 'not at all' provided at their club. Confidence talking about the

1
2
3 menstrual cycle, and knowledge of its effects on training and performance, participation
4
5 and health were rated more favourable. For instance, 22% of all participants said that
6
7 they felt 'extremely confident' talking about menstrual cycle, although 18% said that
8
9 they felt 'not at all confident'.
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review Only

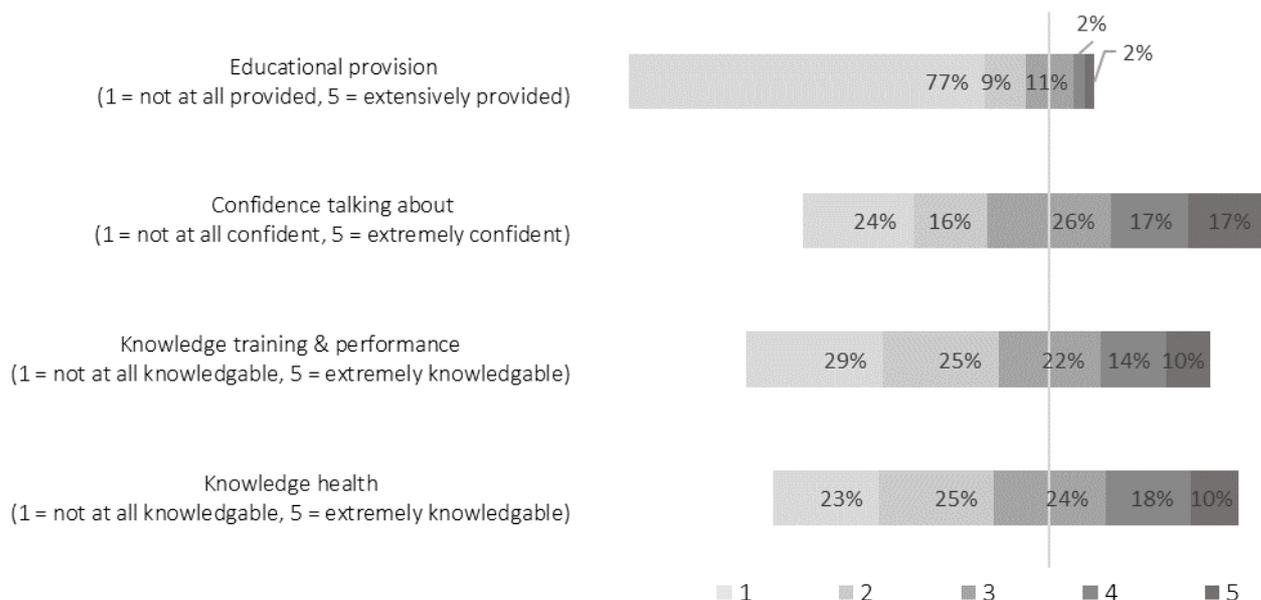


Figure 2. Likert responses, from all survey respondents, on hormonal contraception.

Participants were asked about the extent to which education was provided about hormonal contraception at their club, how confident they felt talking about it, and on how knowledgeable they felt about how hormonal contraception might affect health, training and performance.

Alt text: A divergent stacked bar chart is shown in greyscale, which indicates how 'educational provision' about hormonal contraception was perceived to be less well provided at participants' clubs, with 77% of respondents saying that educational provision on hormonal contraception was 'not at all' provided at their club. Confidence talking about hormonal contraception, and knowledge of their-its effects on training and performance, participation and health were rated more favourable. For instance, 17% of respondents said that they felt 'extremely confident' talking about hormonal contraception, although 24% said that they felt 'not at all confident'. Knowledge on the effects of hormonal contraception on health was perceived to be slightly better than knowledge on the effects on training and performance.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review Only

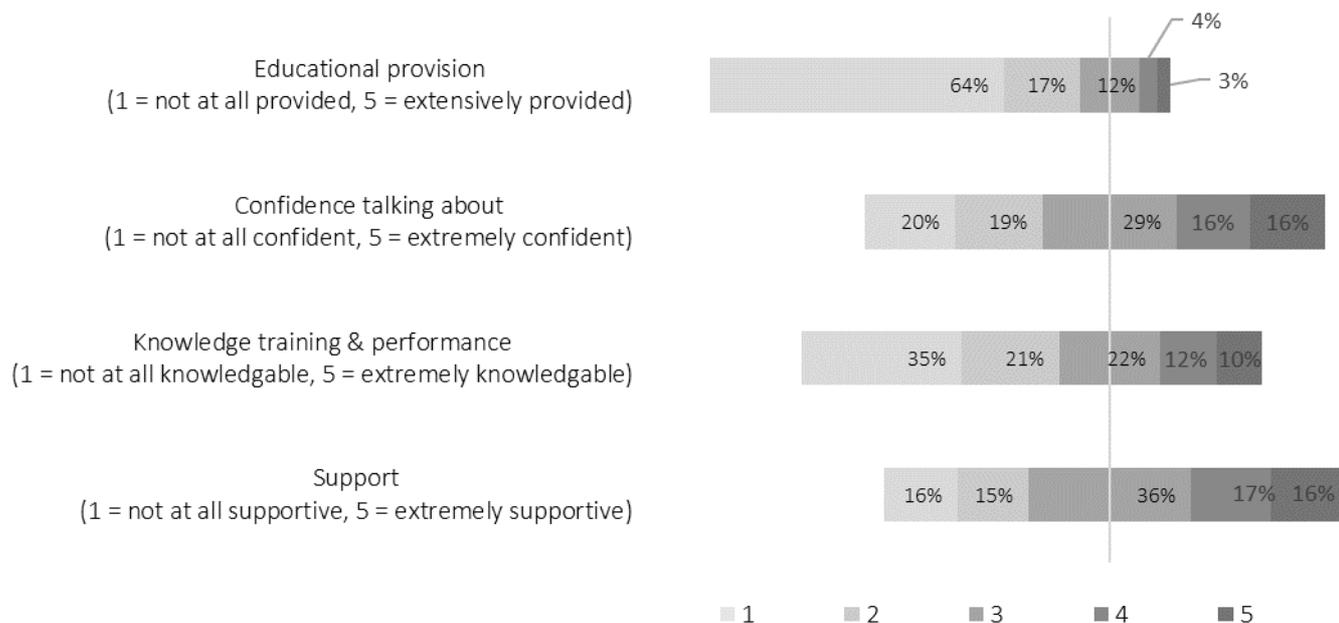


Figure 3. Likert responses, from all survey respondents, on pregnancy and the postpartum period. Participants were asked about the extent to which they felt information was provided about pregnancy and postpartum at their club, how confident they felt talking about things, on how knowledgeable they felt about how pregnancy and postpartum might training and performance, as well as the extent to which they felt support was given at their current club for pregnancy and postpartum.

Alt text: A divergent stacked bar chart is shown in greyscale, which indicates how ‘educational provision’ about ~~the~~ pregnancy and postpartum was perceived to be not very well provided at participants’ clubs, with 64% of all participants saying that educational provision on ~~menstrual cycle~~ pregnancy and postpartum was ‘not at all’ provided at their club. Participants rated the support they received from their club regarding pregnancy and postpartum more favourably, with 16% saying that their club was ‘extremely supportive’. Regarding confidence talking about pregnancy and postpartum, 16% of all participants said that they felt ‘extremely confident’ ~~talking about menstrual cycle~~. Perceived knowledge on how pregnancy and postpartum affects

1
2
3 training and performance was not rated highly, with, for instance, 35% of participants
4
5 saying they felt 'not at all knowledgeable'.
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review Only

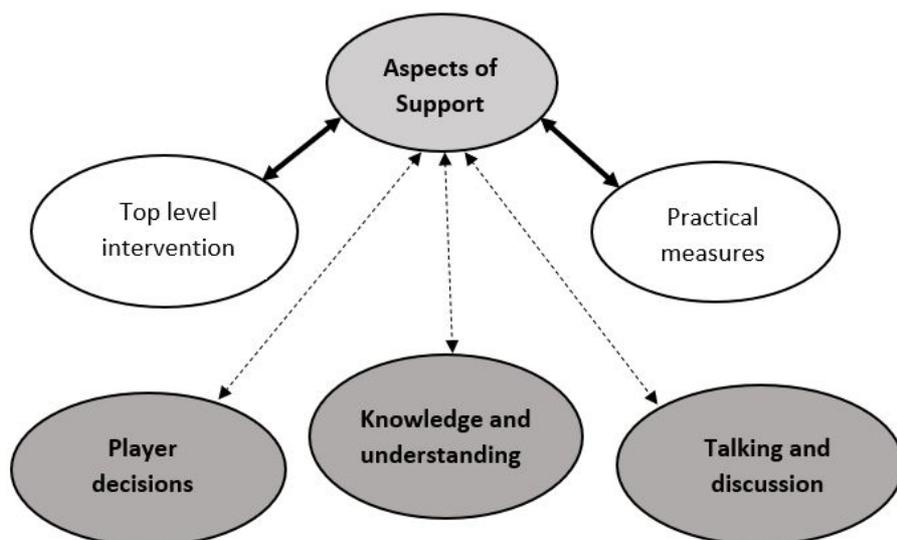


Figure 4. Depiction of thematic structure

Focus group/interview data were transcribed and analysed using reflexive thematic analysis; the themes are depicted in the diagram. The theme of ‘aspects of support’ is central to the findings and links to all other themes (as depicted by the dotted lines). It encompassed two sub themes (as depicted by solid lines): ‘practical measures’ (the support available to players) and ‘top-level intervention’ (the responsibility of management). The other themes were ‘knowledge and understanding’, which examined the source and extent of current information around menstrual cycle, hormonal contraception and pregnancy, ‘talking and discussion’, which focussed on the openness and willingness of information sharing between coaches and players, and ‘player decisions’, which looked at players’ choices and reasons around starting a family.

Alt text: The diagram shows the four themes from the thematic analysis, with ‘aspects of support’ shown at the top to indicate how this theme is central to the findings.

Subthemes of ‘aspects of support’ are shown by not being shaded and are linked with a

1
2
3 bold double arrow, showing a two-way connection. Dotted arrows between the three
4
5 other themes (player decisions, understanding and knowledge, talking and discussion)
6
7 represent a two-way connection with the theme 'aspects of support'. ~~The two unshaded~~
8
9
10 ~~subthemes of support are linked with a bold double arrow, showing a two-way~~
11
12 ~~connection.~~
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review Only