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5 **Understanding female coaches' and practitioners' experience and support provision in**
6 **relation to the menstrual cycle**

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Abstract

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The study aimed to develop an understanding of female coaches' and sport science practitioners' experience and support provision in relation to the menstrual cycle when working with female athletes. Following receipt of institutional ethical approval, 14 female coaches and practitioners (32.9±6.9 yrs) participated in individual semi-structured interviews. Following analysis, two themes were developed: 1) Knowledge and awareness, and 2) Support and management. Overall, it appeared that participants varied in their understanding and awareness of the impact of the menstrual cycle on sport performance, somewhat influenced by their own personal experiences. Participants' knowledge and awareness subsequently impacted the support they provided to female athletes. Additionally, individual experiences and perceived secrecy relating to the menstrual cycle impacted on the informational and emotional support participants provided. Together, the findings highlight the importance of all coaches and practitioners enhancing their knowledge and understanding regarding the menstrual cycle and proactively providing support to athletes. Education to enhance coaches' and practitioners' knowledge and understanding will help to create a more open and supportive environment in sport, hopefully allowing for personal discomfort regarding the menstrual cycle to be addressed.

66 Key words: Female athletes, coaching, sport science, periods, menstruation

67 The menstrual cycle is a repeating pattern of fluctuating hormones; the increases and
68 decreases in oestrogen and progesterone can cause individuals to experience different
69 symptoms, both physical and psychological¹. For example, literature has shown menstrual
70 cycle symptoms such as heavy menstrual bleeding and mood disturbances are widespread
71 among the general population and these symptoms can have a large impact on women's
72 quality of life², including attendance at school or work^{3,4,5}. In a recent survey, 38% of
73 women reported not being able to perform all their regular daily activities when experiencing
74 menstrual symptoms². Within school, academic performance has been shown to be affected,
75 with 20.1% of girls reporting absence from school due to dysmenorrhea (period pain) and
76 40.9% reporting classroom performance or concentration were negatively affected⁴. Of those
77 affected by their symptoms, only 48.6% are reported to tell their family that menstrual
78 symptoms were the reason³. Choosing not to share this information with family may occur
79 because symptoms, such as period pain, are often perceived as 'normal'⁴ and therefore just
80 accepted. This is often reinforced by family and friends who have the same period pain and
81 equally perceive having to 'endure' menstrual pain and symptoms as an integral part of
82 female life, using self-care strategies rather than seeking medical advice to manage pain⁵.
83 However, frequently the most effective options for pain management are not chosen and
84 menstrual-related symptoms continue to have a negative impact day-to-day⁵.

85 One of the daily activities that can be impacted by menstrual symptoms is
86 participation in sport and physical activity⁶. For athletes, for whom sport is their career, any
87 impact on the ability to train and/or perform could be substantial^{7,8,9}. To date, research
88 exploring the experiences of the menstrual cycle on elite female athletes has demonstrated a
89 clear impact on daily activities and sporting performance^{8,9,10}. For instance, Findlay et al.⁹
90 conveyed that 93% of athletes reported menstrual cycle related physical symptoms, with over
91 two-thirds indicating a negative effect on training. Psychological symptoms were also

92 reported to impact upon performance, including a reduced ability to focus⁹. Similarly, Brown
93 et al.⁸ reported extensive influences of the menstrual cycle on athletes' training and
94 competition performance. It was identified that female athletes were often uncomfortable
95 with, and usually avoided having conversations relating to, the impact of their menstrual
96 cycle on sport participation, training, or performance⁸. Reinforcing this finding, Armour et
97 al.¹⁰ identified that 76% of athletes in their study did not discuss menstruation with their
98 coaches. If athletes chose to have conversations about menstruation, it appears that they
99 prefer to talk to female coaches or practitioners⁸.

100 As female coaches and sport science practitioners have likely experienced the
101 menstrual cycle and some associated symptoms, it may be assumed they have greater
102 awareness, understanding, or empathy for female athletes⁸ and that issues around discussing
103 the menstrual cycle are specific to male coaches. This is supported by research suggesting
104 male coaches are aware they lack knowledge about the menstrual cycle and want policies
105 and/or an education framework about the menstrual cycle to guide training practices in
106 female athletes¹¹. However, personal experiences across the menstrual cycle may influence
107 female coaches and practitioners' understanding and subsequent support provision for
108 athletes due to societal embarrassment about the menstrual cycle, which leads to secrecy
109 about this topic. These ideas have been reinforced by many adverts for menstrual products
110 having a consistent theme, namely emphasising the importance of secrecy, and the need to
111 avoid social embarrassment¹². Elite athletes have indicated that the sporting environment
112 does not vary from societal perceptions regarding the menstrual cycle⁸. Therefore, female
113 coaches' and practitioners are likely to be influenced by these social norms, which may also
114 affect their openness and support provision concerning the menstrual cycle. As outlined by
115 Nicholson¹³, it is not just the immediate effects on women and their perceptions of their own
116 performance through the menstrual cycle that need to be explored, self-cognitions are located

117 within history and culture that has permeated popular beliefs and constrained the thinking of
118 men and women, scientists and non-scientists.

119 Personal symptoms that result from the menstrual cycle may have a wider impact on
120 coaches and practitioners within their roles at work, beyond that of supporting female
121 athletes. Sport coaches and practitioners operate within a complex, ever-changing
122 environment that imposes many pressures on them¹⁴. Pressure and stress are known to
123 heighten menstrual cycle symptoms^{15,16}, which may affect coaches and practitioners, their
124 relationships, and support provision. However, it is unknown if such individuals have an
125 awareness of their own menstrual cycle related symptoms or if this has any consequential
126 impact on female athlete support. Rynne et al.¹⁷ highlighted the importance of considering
127 and developing the associated knowledge bases informing coach and practitioner practice to
128 establish and refine the organisational structures that support them. Yet, to-date, the impact of
129 personal menstrual cycle symptoms and understanding of female coaches and practitioners'
130 performance in relation to supporting female athletes has not been considered.

131 To this end, the purpose of the current study was to develop an understanding of
132 female coaches' and sport science practitioners' experience and support provision in relation
133 to the menstrual cycle when working with female athletes. Additionally, this study sought to
134 explore the influence that female coaches' and practitioners' own menstrual experiences had
135 on the support they provide to athletes.

136 Method

137 Study design

138 To address the aims of this study a qualitative descriptive methodology^{18,19} was
139 adopted. Qualitative descriptive studies seek to obtain in-depth insights from participants
140 pertaining to their experiences of a particular phenomenon, while producing descriptive
141 accounts that remain close to the participants' words and produce insights that may be useful

142 in practice^{18,19}. Given the aim for this research was to produce data that could be used to help
143 guide the work of coaches and sports organisations, this methodology was deemed appropriate.
144 Aligned with this methodology, the current study was positioned within the interpretivist
145 paradigm, underpinned by ontological relativism and epistemological constructionism. That is,
146 it was assumed that reality is multiple and subjective, and that knowledge is socially
147 constructed²⁰.

148 **Participants**

149 Following receipt of institutional ethical approval, fourteen female coaches and sport
150 science practitioners working with elite female athletes, were purposefully sampled to take
151 part in a semi-structured interview (Table 1). Criterion-based, purposeful sampling was used
152 to ensure information rich participants were sampled to learn about matters of central
153 importance to the purpose of this study²¹, focusing specifically on female coaches and
154 practitioners' experiences of the menstrual cycle.

155 *****Insert Table 1 around here*****

156 **Procedure**

157 The lead researcher contacted potential participants via email, providing them with an
158 overview of the study as well as a consent form. Interested participants were asked to contact
159 the lead researcher if they were interested in participating and a suitable time for an interview
160 was organised. Prior to the interview, an explanation of the study was provided, and
161 participants gave informed written consent to participate. Through a short-written survey,
162 some key pieces of demographic information were collected (e.g., age, sport, years of
163 coaching experience). Subsequently, interviews focused on questions ranging from
164 participants' knowledge and understanding of the impact of the menstrual cycle in sport, their
165 own menstrual cycle symptoms and experiences and the steps they took to support athletes.

166 Specifically, the interview started with introductory questions such as “How long have you
167 been working with female athletes?” and “How do you generally support athletes?” to
168 provide an opportunity to develop rapport. Subsequently the interviews focused on the main
169 questions, including, “What are your perceptions of the menstrual cycle?” “What is your
170 experience of your menstrual cycle?” “As a coach/sport scientist do you consider the
171 menstrual cycle in your training? Or related to competition?” “How do you feel having
172 conversations about the menstrual cycle?” Finally, the interviews concluded with summary
173 questions seeking to gain insights into further information that coaches may find beneficial.
174 Interviews lasted between 24.26 and 77.59 minutes ($M= 47.30 \pm 15.24$).

175 **Data Analysis**

176 Each interview was audio recorded and transcribed verbatim. Each participant
177 transcript was analysed by the first author using qualitative analysis procedures
178 recommended by Miles, Huberman, and Saldaña²². Firstly, descriptive codes were assigned
179 to the data to identify raw data themes. Subsequently, descriptive codes were grouped into
180 more abstract concepts to form interpretive codes. Lastly, pattern codes were identified which
181 recognised relationships between interpretative codes. The final phase of analysis was the
182 writing of the results section because writing is viewed as part of the analysis in qualitative
183 research.

184 **Methodological Rigour**

185 Throughout the development and implementation of this study, several steps were
186 taken to enhance methodological rigour aligned with recommendations for qualitative
187 descriptive studies^{23,24,25}. Specifically, attempts were taken throughout to enhance the
188 authenticity, credibility, criticality, and integrity of the study. To achieve this, purposeful
189 sampling to achieve an adequate participant sample who could provide sufficient rich
190 information was utilised. A pilot interview was conducted to check the appropriateness of the

191 questions and whether they would achieve the appropriate level of depth in response. The
192 analysis was driven by the voices of the participants, with a specific focus on their ideas
193 driving the generation of codes and themes. Finally, regular reflections and discussions
194 occurred among the research team throughout the data collection and analysis process, with
195 the second author acting as a critical friend to challenge assumptions and the coding of data²⁶.

196 **Results**

197 Analysis of the data led to the development of two main themes and 5 associated sub
198 themes (Table 2). The main themes, which are discussed in detail below, focused upon 1)
199 Knowledge and awareness of the menstrual cycle and the potential impact in sport, and 2)
200 Management of the menstrual cycle and support provided to female athletes.

201 *****Insert Table 2 around here *****

202 *Knowledge and awareness of the menstrual cycle and potential impact in sport*

203 There was a disparity in knowledge and awareness among participants regarding the
204 impact of the menstrual cycle in sport. Many participants perceived their knowledge of how
205 the menstrual cycle might impact on female athletes to be relatively limited, as one
206 practitioner summarised, “I don’t know much about the science, I feel like I’m a bad woman
207 because I don’t know what’s going on” (P2) and one coach outlined, “I would need to learn a
208 bit more, I wouldn’t say I massively know how it would impact” (C7). Interestingly, in such
209 instances, participants recognised that their personal experiences had not necessarily
210 equipped them for working with female athletes because, “I never really experienced being
211 like that [experiencing symptoms] myself, so it’s harder to relate” (C7). Similarly, for some
212 participants their lack of awareness or understanding of the possible impact of the menstrual
213 cycle was a result of their personal use of hormonal contraceptives, which altered their
214 symptoms and experiences. For instance, one participant explained that their experiences of
215 the menstrual cycle, such as heavy bleeding, were substantially reduced, as “Having the

216 implant, you haven't got to deal with anything" (C7). Consequently, participants whose own
217 symptoms were limited or managed with contraceptives did not always realise or understand
218 what athletes might experience.

219 Personal experience was not the only factor that contributed to a lack of awareness or
220 knowledge regarding how the menstrual cycle might impact upon athletes – a lack of
221 experience with athletes also appeared to contribute. For instance, one coach stated, "I've
222 never had one gymnast who's had any problem with their periods", potentially influenced by
223 personal awareness due to "never had any period problems whatsoever" (C5), despite
224 highlighting "in our sport most of the girls are at the lighter end of their puberty weights so
225 periods come later" (C5).

226 Finally, perceptions of the menstrual cycle within society and a lack of education also
227 appeared to contribute to a lack of understanding of the menstrual cycle and the potential
228 impact within sport. For instance, summing up the comments made by several participants
229 when asked about support needed to help athletes manage their menstrual cycle, one
230 practitioner simply stated, "everyone will probably be going through it [menstrual cycle] so
231 you've just got to suck it up" (P7). Moreover, despite many of the participants demonstrating
232 a lack of understanding regarding this topic throughout their interviews, they felt that others
233 were in a worse position than themselves. Specifically, participants suggested that, rather
234 than increasing their own knowledge, "male coaches need to be made more aware" (P2) and
235 "there is so much work to do in terms of educating others" (P3).

236 In contrast, some individuals had an awareness of the broad spectrum of symptoms
237 and variability of impact of the menstrual cycle on sport performance, highlighting factors
238 such as "sometimes it's not actually the period that's affecting performance, it can be just that
239 extra thing to think about" (P6) or "some of them do have tiredness, it's almost like a false
240 adaptation for the girls because they feel like that" (C3). For these participants, they indicated

241 that their personal experience of symptoms or consequences associated with menstruating
242 helped them to feel better prepared to understand their athletes' experiences. For instance,
243 one coach explained, "I've always been aware of it, I guess, initially because I knew how I
244 reacted when I was going through my cycle" (C2) while another reflected, "I think it helps
245 you know how others feel" (C3) and finally "without my own experience I wouldn't be as
246 sympathetic, I don't think I would have because I wouldn't have understood" (C1). Personal
247 experience in sport also increased awareness of the impact on performance, such as one
248 practitioner sharing "I couldn't dance when I was on [period] I'd try and lost all my
249 technique' (P2).

250 Additionally, participants who had more experience coaching or working with female
251 athletes for extended periods of time also felt that their awareness and knowledge of this area
252 had increased. This was highlighted by two coaches, one who suggested, "When I first started
253 [coaching] I probably didn't have the same level of awareness as I do now" (C4) and another
254 explained, "I've always been aware, but perhaps more honed the more I've worked longer
255 with those athletes" (C3). Finally, specifically for some practitioners, attendance at external
256 presentations and social media had also increased awareness, as one shared a presentation,
257 "opened my eyes to the fact I wasn't necessarily considering menstrual function" (P5).

258 The culture and environment in the sport, along with duration of coach-athlete
259 relationships, were also thought to contribute to awareness of the menstrual cycle and
260 associated impact among coaches. As one coach explained:

261 The girls in the centre are quite happy to talk about it because as a whole centre we're
262 quite open, the other two coaches are male and they are aware and happy to talk about
263 it. It helps to make it clear it's not an issue just normal and anyone can talk about it
264 (C2).

265 Similarly, reflecting on awareness, coach-athlete relationship quality was an impacting factor,
266 another coach shared:

267 I do treat it very openly and expect my coaches, I've had to say to them this is the
268 way we approach it because its normal, it's a normal thing...as part of a coaching
269 team you've got to connect with your athletes and that is about communication
270 regarding anything and everything. We're working in an environment that we want
271 the best from everybody then there has to be an awareness about it [menstrual cycle]
272 (C3).

273 *Management of the menstrual cycle and support provided to female athletes*

274 Management of the menstrual cycle by female coaches and practitioners with regards
275 to their own personal experiences was not necessarily reflected in support provided,
276 particularly at competitions. For instance, many participants discussed their own worry of
277 leaking or "showing through" which resulted in them taking several steps to manage their own
278 menstrual cycle. As examples, participants ensured they, "always have this bag with me, it has
279 tampons and pads" (P2) and that they are:

280 Prepared at competition, as silly as making sure I know where the loos are and I'll
281 have a tampon in my pocket because sometimes you put your bag down and you're 2k
282 away from your bag and you know you need to change and the practicalities of
283 it...you just get conscious you might be leaking (C6).

284 However, despite these personal experiences and awareness of this fear of leaking or blood
285 showing through as also shared by athletes ("I've known athletes putting tampons in before
286 matches even though they are not on just in case they come on during the match" (P6)) coaches
287 and practitioners reflected that they provided very little informational support to athletes to
288 help with this. As one coach explained they have, "a dress rehearsal of what it will be to arrive,
289 rig your boat, get on the water, come off, debrief, talk, snacks...[But] in all of that, no

290 conversation about periods, no acknowledgement in my head of what if one of the girls is on
291 her period” (C6). Similarly, a practitioner indicated that she had, “done talks with younger
292 athletes just to raise awareness” generally, “we haven’t talked around how that [menstrual
293 cycle] affects competition” (P1). The lack of informational support provided in relation to
294 competitions was deemed to be heightened if athletes were working with male coaches, as one
295 coach explained in relation to a female athlete, she was given “no advice at all whilst under a
296 male coach and she felt that she couldn’t get help to manage it [menstrual cycle]” (C7).

297 In contrast, participants indicated that they did provide some informational and
298 tangible support in relation to training. For instance, as one coach explained when discussing
299 training situations, “we started putting sanitary products in the toilets because the girls would
300 go to the toilet and there was nothing in there, they’d get caught out” (C6). More commonly,
301 however, participants focused their attention on adapting sessions. A coach explained, “I
302 make the girls aware of it [their menstrual cycle] and how it can affect training, if we have to
303 adjust the session during that time then we will” (C1). However, based on personal
304 experiences of feeling better if they exercised, coaches were hesitant to remove training
305 sessions entirely, instead explaining, “actually I find light exercise helps myself, I say to girls
306 sometimes maybe just doing a bit of light exercise can kind of help” (C4).

307 Despite indicating a willingness to make adaptations to training, there was also a
308 recognition that there is a lot of secrecy about menstruating. Reflecting on her own menstrual
309 cycle, one participant shared, “[you] just hide it I think because we are told not to let it affect
310 you” (P5). This need to hide the symptoms of their menstrual cycle was particularly common
311 in relation to competitions, with participants explaining, “I am more agitated or irritated and I
312 have to hide it otherwise I’m just taking it out on athletes” (C2) and “you feel like you’ve got
313 to put this front on, and you can’t be seen that you can’t deal with it” (P1). However, it was
314 recognised that, “we’re not helping future females coming into that environment” (P6) when

315 adopting this approach as it results in athletes avoiding reporting or hiding symptoms
316 because, “a lot of the athletes perceive it as being weak” (P5).

317 To counter this secrecy, one coach explicitly sought to discuss the menstrual cycle
318 with her athletes, explaining “it’s just part of being female and I look at it as really positive
319 within sport and encouraging this in my girls” (C3). She also reported implementing
320 numerous strategies such as holding talks with swimmers and parents, embedding protocols
321 such as wearing shorts during warm up on poolside and encouraging girls to “keep an eye on
322 each other...if they notice any leaking or anything” (C3). However, such a proactive
323 approach was not apparent across many participants. Rather, conversations relating to the
324 menstrual cycle were often absent or limited, significantly influencing support provided to
325 female athletes (“because it’s not the day-to-day conversation I wouldn’t necessarily be the
326 one to bring it up” P4). A few participants had engaged in conversation with their athletes
327 and reflected that, “after one conversation they were all talking about periods and how it
328 affects them, I do think it made a big difference” (P1).

329 The likelihood of such conversations occurring, as well as the openness of them, was
330 influenced by multiple factors, particularly gender. As a practitioner explained, “There have
331 been a few occasions where athletes come to me and are like ‘I feel horrendous’ and I ask if
332 they have told anyone and they’re like ‘No because they are all men’” (P2). This often-
333 reflected participants’ personal experiences, as they explained, “I’m happy talking to anyone,
334 but sometimes you feel because the men don’t truly understand what it feels like, it’s easier to
335 talk to a woman about it” (P7) and “I talked to people back at home I didn’t talk to anyone
336 out there I wouldn’t and still wouldn’t speak to them [male staff]” (C1). It should be noted,
337 however, that participants did share some examples of positive conversations with male
338 coaches (e.g., “the two PD’s [performance directors] I was working with they were having

339 really good conversations about the fact they were all female athletes and differences and
340 how that might interlink with performance” (P4)), they were just infrequent.

341 Participants also thought athletes lacked the necessary awareness to inform them of
342 symptoms, which subsequently impacted upon the support they were able to provide to the
343 athlete, as one practitioner suggested, “sometimes they haven’t realised and then the next day
344 they come on and they don’t realise until after the impact on their performance” (P5). This
345 was consistent with some coaches providing support through helping their athletes increase
346 self-awareness “I make the girls aware of it and how it does affect training” (C1).

347 Nevertheless, some participants, particularly those who deemed the menstrual cycle to have
348 limited impact on their athletes, thought that a little knowledge could be detrimental and
349 disagreed with providing knowledge and awareness of the menstrual cycle to female athletes:

350 In 30 odd years of coaching, it was never a problem, it was quite interesting at this
351 World Championships, the week before at a training camp we had a talk of
352 menstruation...it was gobsmacking seeing how much them having information, they
353 used to just get on with it (C5).

354 Finally, personal beliefs about and comfort with the topic were also perceived to
355 influence support relating to menstrual health. As one coach shared, “because I see it as a
356 very important part of female health, I’ve pretty much always been very open with the girls
357 and having discussions” (C4) to ensure support was provided to female athletes. However,
358 other coaches were more reticent to discuss it, particularly if athletes seemed uncomfortable;
359 “it’s a difficult thing to bring up because some girls do feel very uncomfortable about it”
360 (P2), and summarised by one coach, “I think it’s a fine balance between talking openly with
361 them about it but not deterring them because you’re too open” (C6). For a few practitioners,
362 some of the perceived awkwardness regarding menstrual cycle discussion was overcome due
363 to the nature of their job. Specifically, as one practitioner explained, “in terms of opening a

364 conversation its really easy because I've got a list of questions I'm going to ask, one is about
365 menstrual function" (P2). Nevertheless, in general, participants explained that there was
366 often hesitation to discuss or explicitly provide support to athletes for their menstrual cycle
367 because of the norms imbedded in society. As on coach summarised, "I think it's just in this
368 country we're not very open about it in general" (C5).

369 **Discussion**

370 The purpose of this study was to develop an understanding of female coaches' and
371 sport science practitioners' experience and support provision in relation to the menstrual
372 cycle when working with female athletes, whilst considering the influence of personal
373 experience. Overall, the findings highlighted a variance in participant knowledge and
374 awareness of the menstrual cycle in relation to sport, with individual experiences influencing
375 and impacting tangible, informational, and emotional support provided to athletes.

376 Similar to findings with athletes,^{8,9,10} female coaches and practitioners were reluctant
377 to talk about their own menstrual experiences whilst in a professional environment, reporting
378 masking symptoms and hesitancy to talk to male colleagues. It is perhaps not surprising
379 female athletes are reluctant to talk about the menstrual cycle^{8,9} when female coaches and
380 practitioners display secrecy and limited conversations about their own experiences. There is
381 consistency in the concept that women assemble an idea of a 'normal' period from their own
382 experiences⁵. Therefore, it is important to recognise women's individual perspectives and
383 established societal norms in addition to physical symptoms to better understand and
384 normalise the menstrual cycle in sport²⁷.

385 Participants highlighted that some of their secrecy was developed through social
386 perceptions of the menstrual cycle being something to keep out of sight²⁸. The media
387 consistently emphasises negative portrayals of the menstrual cycle, with nearly 1 in 4 young
388 people having seen the menstrual cycle referred to negatively on TV²⁹ and advertisements for

389 menstrual products leading many girls to believe that menstruation is to be hidden, concealed
390 and managed alone³⁰. In conjunction with established perceptions, limited education may
391 further exaggerate silence and secrecy due to limited knowledge and awareness. Plan UK¹²
392 identified 1 in 4 girls did not feel they knew what to do when they started their period,
393 identifying several gaps and misunderstandings within their knowledge of the menstrual
394 cycle. Family, friends and teachers have previously been common sources of information
395 and have been shown to play a significant role in providing information about menstruation⁵.
396 Through provision of education individuals are aware of effective options for self-
397 management of menstrual cycle-related symptoms and encourage women to seek medical
398 advice to help improve management strategies³¹. The combination of cultural perceptions
399 and limited education present a lack of support within participants own experience, adopting
400 an approach to ‘get on and manage in silence’ in a sport environment^{8,9} that does not differ
401 from wider society.

402 Consistent with recommendations that we need to create a society in which
403 menstruation is less stigmatised²⁹, within sport, coaches and practitioners need to address
404 their own discomfort regarding the menstrual cycle conversations and challenge against the
405 need for secrecy. As such, information and education need to be provided not only to male
406 coaches and practitioners, but also females, to increase knowledge of menstrual cycle
407 symptoms, awareness of experiences that differ from their own, enhance confidence to
408 engage in conversations with athletes and colleagues about the menstrual cycle, and stimulate
409 personal reflection. Recent evidence suggests that education approaches can be effective in
410 this area³¹. For instance, the provision of web-based education has been shown to improve
411 health literacy and understanding of the menstrual cycle; with 48.8% of participants
412 completing the course indicating that it had changed what they thought was a ‘normal
413 period’³¹. The repeating nature of experiences of athletes, coaches and practitioners

414 highlights the need to target both groups together, completing athlete, coach and practitioner
415 education is required to create a change in perceptions and support received by athletes and
416 provided from coaches and practitioners.

417 Very limited support was reported to be provided at competition, highlighting an
418 important aspect of sport preparation and performance to focus on. However, in training
419 environments, it was more apparent where informational support assisted athletes to adjust
420 training sessions based on menstrual cycle symptoms or even emotional support from female
421 coaches and practitioners. Examples of tangible support, through provision of menstrual
422 products was also provided. The level of support varied between coaches and practitioners,
423 additional factors also influenced the different types of social support³² provided to female
424 athletes in training such as the situation, experience, and gender. This variation in support
425 provision is useful when it appropriately matches the demands or stressors an athlete is
426 facing³³; however, it is apparent that the necessary types of support, particularly
427 informational and emotional support, needed to address all menstrual demands/stressors is
428 not present. Confidence to provide support regarding menstruation from all members of an
429 athlete's support network (e.g., coaches, practitioners, parents) is critical given the important
430 role social support plays in enabling athletes to manage stressors, gain the most psychosocial
431 outcomes, and perform at their best³⁴. The support also needs to be expanded beyond
432 training and considered within competition where aspects such as toilet facilities and
433 changing rooms may be limited, requiring informational and emotional support to assist with
434 the management of that 'extra distraction'⁹.

435 However, the provision of support alone may not be sufficient. Athletes must also be
436 willing to seek out and access this support, to avoid menstrual cycle issues remaining
437 undetected/unsupported⁹. Athletes have reported preference to seek advice from medical
438 sources than non-experts and reluctance to confide in their coaches due to feelings of

439 embarrassment, gender and perceptions there is nothing that their coach could do to help⁹.
440 Unfortunately, aligned with the cultural issues identified regarding the presentation of the
441 menstrual cycle, participants suggested that female athletes resisted reporting menstrual cycle
442 symptoms, and consequently accessing support, because they would also be perceived as
443 weak. To overcome this issue, all coaches and practitioners need to be proactive in providing
444 support as well as encouraging of athletes who do seek out and utilise the support that is
445 available³⁴. Athletes may benefit by learning to recognise their needs, understand the specific
446 problem relating to their menstrual cycle and sport, and specific types of support to help deal
447 with them³²; an important aspect of this being coaches and practitioners as an athlete's
448 support network⁹. All individuals involved in sport (i.e., athletes, coaches, support staff,
449 parents) should be aware the menstrual cycle is an equally important factor to consider when
450 aiming to maximise both training and competition performance, creating the primary focus
451 for purpose and therefore comfort of conversations.

452 In seeking to overcome some of the issues regarding support provision and use,
453 interventions with coaches and practitioners to improve the quality and appropriateness of the
454 support they provide may be useful³². Tangible support, such as providing access to
455 menstrual products, may be relatively easy for coaches and practitioners to provide due to
456 reduced reliance on knowledge or associated discussions. But it is clear from the findings of
457 this study, that informational and emotional support is clearly needed and therefore education
458 to enhance coaches and practitioner's knowledge and understanding is desired. This is
459 supported by other research^{8,9,10} stating coaches and athletes need to have a more open
460 dialogue around the menstrual cycle given the perceived negative impact on performance.
461 Armour et al.³⁰ highlighted the positive influence of an online intervention to improve
462 menstrual health literature in young women, a similar approach may be effective for athletes,
463 coaches, support staff and parents.

464 One critical aspect of emotional support required is the management of anxiety.
465 Consistent with previous research⁹, anxiety of leaking was prevalent within current
466 participants and their athletes. Brown et al.⁸ previously reported the anxiety of leaking being
467 a distraction for athletes at competition, creating an additional component to think about and
468 manage. Consistently, female coaches and practitioners reported this as an anxiety at
469 competition when access to facilities are unknown or difficult, creating additional stress and
470 anxiety in an already high-pressure situation. However, female coach and practitioner
471 personal experience did not translate into support provision for athletes. Therefore, to create
472 change, support at an organisational level is required and recommended to help improve
473 access to facilities in training and competition venues for coaches, practitioners and athletes
474 initiated by increasing the awareness of this issue through open conversations.

475 **Limitations and Areas for Future Research**

476 Limitations of the study should be considered, only one interview was completed with
477 everyone, additional interviews may have increased comfort of conversations for some
478 individuals and enhanced the depth of discussion collected. In some instances, it was the first
479 time the participant had discussed their menstrual cycle, which may have influenced the
480 quality of information collected alongside the different times of the menstrual cycle when
481 interviews were completed, which may have affected responses due to recall error. Further
482 limitations of broader application of findings should be considered as all coaches and
483 practitioners were based in and coaching Welsh athletes within individual sports, therefore,
484 given the perceived impact of culture on the findings, future research should be completed to
485 identify if personal experiences and support provision are similar across countries and team
486 sports. As female coaches are still a minority within coaching roles, support provision
487 provided by male coaches to female athletes should also be explored to fully understand
488 support received by female athletes.

489 **Conclusion**

490 This study is the first to explore female coaches' and practitioners' understanding and
491 experience of the menstrual cycle and the subsequent support provided to female athletes.

492 The findings highlighted a variance in participant knowledge, awareness, and support
493 provided to female athletes relative to the menstrual cycle in sport, with personal experiences
494 influencing support availability, including conversations held with athletes. All coaches and
495 practitioners need to be proactive in providing support, as well as encourage athletes to utilise
496 the support that is available. Education is required to enhance coaches and practitioner's
497 knowledge and understanding to create a more open and understanding environment in sport,
498 addressing their own discomfort regarding the menstrual cycle.

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595 Table 1: Participant demographics

Abbreviation	Sport	Participant age (yrs)
P1	Multi-sport*	39
P2	Cycling & swimming	25
P3	Multi-sport*	30
P4	Multi-sport*	33
P5	Boxing	25
P6	Multi-sport*	38
P7	Athletics & judo	30
C1	Weightlifting	28
C2	Triathlon	27
C3	Swimming	40
C4	Athletics	37
C5	Gymnastics	49
C6	Rowing	28
C7	Cycling	31

596 * Multi-sports included individual sports ranging in endurance, strength/power and also combat and
 597 weight-making sports

Table 2: Summary of Findings

Overarching Themes	Subtheme	Raw data theme
Knowledge and awareness of the menstrual cycle and potential impact in sport	Level of awareness and knowledge	Lack of knowledge on menstruation Perceive some knowledge regarding menstruation Reported awareness of potential Basic awareness of impact No awareness of impact Reported awareness of impact No consideration of impact
	Factors impacting awareness and knowledge	Athlete awareness/knowledge Self-awareness Gender Previous education Personal experience of menstruation Perception of menstruation Years of coaching female athletes
Management of the menstrual cycle and support provided to female athletes	Types of support provided	Adjustments to training Providing products Seeking access to facilities Conversations with athletes Emotional support and reassurance Suggestions to manage symptoms Buddy system between athletes
	Factors impacting support/lack of support	Gender Age (coach and athlete) Quality of coach-athlete relationship Societal perceptions of menstruation Athletes' openness and perceptions of menstruation Attitudes and beliefs Environment/facilities Timing Situation (i.e., training/competition) Personal experiences and symptoms Knowledge Perception of role/responsibility Comfort/confidence discussing menstruation Athlete anxiety regarding leaking