
TITLE: Female athletes' decisions to use hormonal contraceptives: a scoping review protocol.

AUTHORS

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PCC

Population: Actively competing female athletes

Concept: Reasons for hormonal contraceptive use and discontinuation

Context: Current or previous hormonal contraceptive use as a female athlete

PRIMARY QUESTION: What is known about the reasons contributing towards athletes' decision to use hormonal contraceptives and/ or decision to stop using hormonal contraceptives?

ABSTRACT

Female athletes from a variety of sports indicate a perceived impact of the menstrual cycle (MC) on their performance (Brown et al., 2021; Ekenros et al., 2022; Findlay et al., 2020). Female athletes often choose to use hormonal contraceptives (HC's) and although their reasons vary, the most consistent one is related to the impact of the MC on performance and training. For example, in a study by Martin et al., (2018) a third of 145 combined oral contraceptive athlete users perceived that cycle manipulation to avoid menstruation can be considered a positive outcome of oral contraceptive use. Therefore, the objective of this scoping review is to investigate the extent of evidence associated with the reasons behind female athletes' decision to use or discontinue use of hormonal contraceptives. The inclusion criteria included a) female (sex assigned at birth), b) athletes actively participating in competition, of which the majority are competing at least a regional level (Swann et al., 2015), c) sample is mostly age 18 years or older, d) discusses knowledge, reasons, perceptions, attitudes, beliefs of the athletes as related to their decisions regarding HC use and e) discusses history of hormonal contraceptive use either current or previous as an athlete. The JBI guidelines for scoping reviews found in the JBI Manual for Evidence Synthesis (2020) will be followed and this review will be reported in accordance with the PRISMA –ScR extension (Peters et al., 2020; Tricco et al., 2018).

Word count 235

INTRODUCTION

Hormonal contraceptives

The menstrual cycle (MC) is a physiological process characterized by hormonal fluctuations across two broad phases (i.e., follicular phase and luteal phase) that can be further split into early and late follicular, ovulatory, and early, mid, and late luteal phases (Carmichael et al., 2021). Beyond inherent hormonal variability between individuals, the menstrual cycle is also subject to internal (e.g., oligomenorrhea) and external sources of change (i.e., hormonal contraceptives) (Elliott-Sale et al., 2020). Hormonal contraceptives (HCs) are broadly defined as exogenous hormones that limit the presence of endogenous hormones, and prevent ovulation (Elliot-Sale and Hicks, 2018). HCs are used for a variety of health-related purposes and can be split into categories describing the hormonal composition (combined and non-combined) which refers to either the presence of both exogenous progestins and estrogens or progestin-only, respectively (Black et al., 2015). Examples of hormonal contraceptives include the oral pill (combined or progestin-only), implants, progestin releasing intra uterine devices (IUD), transdermal patch, and vaginal rings (Black et al., 2015; Elliot-Sale and Hicks, 2018; World Health Organization, 2023).

Reasons for hormonal contraceptive use by athletes

HCs are regarded by some athletes as helpful in managing MC symptom impact (Brown et al., 2021; Engseth et al., 2022; Findlay et al., 2020) Hormonal profiles of individuals with a menstrual cycle vary, with eumenorrheic cycle durations lasting anywhere from 21 to 35 days (Carmichael et al., 2021). A recent study observed that 51.4% of elite athletes currently not using HCs, experience variable cycle length (Martin et al., 2018). Prevalence of hormonal contraceptive use is also variable and not well researched, with some studies showing high use by athletes. For example, Martin and colleagues (2018) observed that approximately 70% of 430 elite athletes used hormonal contraceptives at some point, 49.5% of which were current users. A similar study also found high prevalence of HC use with 63% (n=679) in athletes (Ekenros et al., 2022).

Some female athletes have used hormonal contraceptives to manipulate their cycle impact on performance, and physicians have also prescribed HCs as a tool to minimize MC symptoms and monthly changes in performance (Martin et al., 2018). However, some athletes who sought out medical experts received vague advice on optimal MC management (Höök et al., 2021). A recent study by Martin et al., (2018) investigating HC prevalence and reasons for use, reported that a third of 145 elite athletes using combined oral contraceptives perceived cycle manipulation to avoid menstruation during competition/training as a benefit (Martin et al., 2018). Likewise, another identified that 49.4% of elite Norwegian cross-country skiers and biathletes see a positive influence of HCs on performance (Engseth et al., 2022). In a different study, the most reported reason for which type of HCs were used was ease of use (Martin et al., 2018). In contrast, reasons contributing to cessation of HCs were mood, perceived lack of need, weight gain, and headaches/migraines. It is important to note that alongside variability of the menstrual cycle, reasons for HC use or discontinuation vary by individual.

Overall, despite this lack of consensus and understanding around the impacts of HCs and the MC on athletic performance and health, athletes continue to indicate using HCs at high

prevalence. Therefore, the purpose of this review is to investigate the reasons contributing towards athletes' decision to use hormonal contraceptives and/ or decision to stop using hormonal contraceptives. In doing so, the review aims to identify gaps in the literature and contribute to furthering the understanding of HC use in athletes to inform future research and female athlete considerations.

Preliminary search: A preliminary search on google scholar was conducted to identify seed articles because of the niche nature of the subject area, Seed articles were read to assess relevance and to ensure the availability of evidence to conduct a scoping review. No current or underway systematic reviews or scoping reviews on the topic were identified through google scholar or PROSPERO at the time of the initial search. This scoping review serves to identify the body of evidence associated with the reasons contributing to female athletes' decision to use or cease use of hormonal contraceptives.

REVIEW QUESTION

This scoping review aims to identify what is known about the reasons contributing towards athletes' decisions to use hormonal contraceptives and/ or decisions to stop using hormonal contraceptives.

KEYWORDS

Hormonal contraceptives; athletes; prevalence; menstrual cycle

ELIGIBILITY CRITERIA (PCC)

Participants:

Inclusion: female (biological sex assigned at birth). Athletes actively participating in competition, of which the majority are competing at least at a regional level (Swann et al., 2015). Majority of the sample is of age 18 years or older.

Exclusion: Community based sport. Locally competing athletes. Non-athlete population and non-active Athletes (i.e., Retired). Athletes actively participating in competition, of which the majority are NOT competing at least at a regional level. Athletes are all male (sex assigned at birth) (no females in sample).

Note: The authors acknowledge that there are individuals whose sex assigned at birth is "female", but they may not identify as cis gender. In recognition of language inconsistency in the literature, this review will use studies describing their sample as women or female.

Concept: The concept of the scoping review is to investigate the reasons for hormonal contraceptive use and cessation of use in athletes. Hormonal contraceptives are considered as exogenous steroid hormones that prevent ovulation (Elliot-Sale and Hicks, 2018). Literature that solely studies the effect of HCs on performance will be excluded.

Context: The context is primarily the female (sex assigned at birth) athlete population. History of hormonal contraceptive use either currently or previously as an athlete.

Types of Sources: This scoping review will consider studies which include:

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- Experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies.
 - Analytical observational studies including prospective and retrospective cohort studies, case-control, and analytical cross-sectional studies.
 - Descriptive observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion.
 - Qualitative studies with designs such as thematic analysis, grounded theory, qualitative description, action research and feminist research.
 - Existing systematic or scoping reviews relevant to the review question.
 - Dissertations and theses if relevant to the review question

Excluded literature:

- Popular literature, letters to editor, editorials, opinion pieces, conference abstracts, books

METHODS

The proposed scoping review will be conducted in accordance with the JBI methodology for scoping reviews from the JBI Manual for Evidence Synthesis (2020) (Peters et al., 2020). The review will cover the reporting items in the 2018 PRISMA scoping review extension (Tricco et al., 2018).

Search Strategy: The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to identify the main search concepts: (1) Hormonal contraceptives, (2) prevalence and reasons for use (3) athletes. The search strategy, including all identified keywords and index terms, will be adapted for each included database and/or information source. The reference list of all included sources of evidence will be screened for additional studies.

Languages of any country of origin or language will be included and if translation is not possible or available, these will be included in the appendix as studies awaiting classification. The preliminary search was used to help choose publication cut-off date. Results related to the topics of search terms hormonal contraceptives, reasons, prevalence, use, and athletes were used. One of the most cited articles relating to the research question by Martin and Colleagues (2018) states it is the first to investigate reasons for use and cessation of use of HCs in elite female athletes. This is a little researched area. Therefore, there is no date limit set. However, based on results seen during screening, a date limit has been set for studies published since the year 1985 to be included to access a breadth of literature in a little researched area while keeping it relevant to the topic.

KAH will develop a search based on the identified main concepts and seed articles, which will then be reviewed by the research team. The following electronic databases will be the information sources for this scoping review:

- Medline ALL (OVID)
 - SCOPUS (Elsevier)
 - SPORTDiscus with Full Text (Ebsco)
 - EMBASE (OVID)
 - CINAHL (Ebsco)
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- Cochrane Library including Cochrane Database of Systematic Reviews and CENTRAL (Wiley)

Grey literature will be searched for on ProQuest Dissertations and Theses Global will be included for relevant theses and dissertations.

Table 1. Search strategy using Database(s): **Embase** 1974 to 2023 September 22
Search Strategy:

#	Searches	Results
1	exp athlete/ or basketball player/ or body builder/ or boxer/ or cyclist/ or football player/ or hockey player/ or skier/ or soccer player/ or triathlete/ or wrestler/ or disabled athlete/ or wheelchair athlete/	77536
2	aquatic sport/ or exp athletics/ or baseball/ or basketball/ or body building/ or boxing/ or exp combat sport/ or contact sport/ or "cricket (sport)"/ or cycling/ or diving/ or endurance sport/ or extreme sport/ or football/ or gymnastics/ or hockey/ or horseback riding/ or ice hockey/ or martial art/ or mountaineering/ or exp racquet sport/ or rock climbing/ or roller skating/ or rowing/ or rugby/ or running/ or skateboarding/ or skating/ or skiing/ or soccer/ or swimming/ or team sport/ or exp tennis/ or "track and field"/ or triathlon/ or volleyball/ or water skiing/ or winter sport/ or wrestling/ or youth sport/	144555
3	sport/	58522
4	(athlete* or athletic* or crew or player* or teammate* or team-mate* or varsity or triathlete* or biathlete* or para-athlete*).tw,kf.	185310
5	sport*.tw,kf,jw.	227844
6	(baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or "net ball" or "racquet sport*" or racquetball or ringette or "roller derb*" or rollerskat* or rodeo* or rugby or skateboard* or skating or skiing or snowboard* or "snow sport*" or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball or goalball* or Paralympic* or biathlon or running or marathon or triathlon).tw,kf.	225718
7	(archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting).tw,kf.	77091

8	(biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*).tw,kf.	40315
9	or/1-8	622272
10	female/	11481696
11	(female* or woman* or women*).tw,kf.	3577673
12	or/10-11	11892164
13	oral contraceptive agent/	45656
14	hormonal contraception/ or hormonal contraceptive agent/	7623
15	intrauterine contraceptive device/ or female contraceptive device/ or exp copper intrauterine device/	21183
16	exp long-acting reversible contraception/	1402
17	contraceptive behavior/ or "oral contraceptive use"/	9581
18	transdermal patch/ or vagina ring/ or female contraceptive device/	9871
19	contracepti*.tw,kf.	92327
20	(intrauterine adj3 (device* or system*)).tw,kf.	12469
21	(iud or iuds).tw,kf.	9867
22	(vaginal ring* or Nuvaring or eluryng).tw,kf.	2190
23	((birth control or contracept*) adj4 (pill* or patch*)).tw,kf.	8439
24	(transdermal adj3 (patch* or implant* or inject*)).tw,kf.	5090
25	(contracept* adj3 (implant* or inject* or coil*)).tw,kf.	3820
26	or/13-25	134130
27	9 and 12 and 26	1185

Study/Source of Evidence selection: Following the search, identified studies will be exported and uploaded into Covidence and duplicates removed. The authors involved in screening (PSM, CV, PKDB) will pilot the screening process through a calibration exercise on 50 randomly selected titles/abstracts from the search results. This pilot screening will be conducted via excel, with the team meeting to discuss screening decisions and clarifying selection criteria as required. An agreement of 75% must be reached prior to commencing screening of the search results. If this requirement is not met, a second round of pilot screening may be necessary to reach 75% consensus. Authors (PSM, CV and PKDB) will screen study titles and abstracts based on inclusion/exclusion criteria aiming to meet 75% agreement as a pilot for the protocol, followed by full text review during the second round.

Once the calibration exercise is completed, screening will be conducted in two phases by two reviewers (PSM and CV) in Covidence. First, titles/abstracts will be screened against the inclusion criteria. Those that are deemed relevant or potentially relevant will move to full text screening. Full texts of the potentially relevant studies will be uploaded to Covidence for screening. Throughout both phases, any disagreements will be resolved by discussion. If a consensus cannot be reached, a third reviewer will be engaged.

The results from this search and study inclusion process will be both recorded and reported in the final scoping review. The studies will be tracked using a PRISMA flowchart per the PRISMA statement (Page et al., 2021)

Data Charting in excel: This will be an iterative process and the final charted data may differ from that which is outlined in this protocol. Any changes that are agreed upon by both reviewers will have the input of a third reviewer to reach consensus.

- Title
- Author(s)
- Publication year
 - Country of origin
 - Purpose/objective/aims
 - Sample size
 - Method of data collection (qualitative/quantitative/both)
 - Study design (if qualitative, methodology specified)
 - Population/demographic characteristics (athlete level descriptor, age, sport(s))
 - Definition of hormonal contraceptive (if given)
 - Type of Hormonal contraceptive category addressed (combined, non-combined (progestin-only), both) and frequency (if given)
 - Specific type of hormonal contraceptive used (ex. Vaginal ring, if given) and frequency (if given)
 - Key findings related to review questions (reasons for use, discontinuation, prevalence)
 - Limitations

Final data will be presented in the scoping review. A study selection flow diagram will be included in the final scoping review. Charted data per the above criteria will be presented in a summary table(s) with method of data collection likely shown as a bubble chart. Frequencies for the general type of HC category and specific type of HC's along with key findings will be displayed in appropriate graphs and charts. Key findings from qualitative studies will likely be depicted via web diagram.

REFERENCES

- Brown, N., Knight, C. J., & Forrest, L. J. (2021). Elite female athletes' experiences and perceptions of the menstrual cycle on training and sport performance. *Scandinavian Journal of Medicine & Science in Sports*, *31*(1), 52–69.
<https://doi.org/10.1111/sms.13818>
- Black, A., Guilbert, E., Costescu, D., Dunn, S., Fisher, W., Kives, S., Mirosh, M., Norman, W. V., Pymar, H., Reid, R., Roy, G., Varto, H., Waddington, A., Wagner, M.-S., Whelan, A. M., Ferguson, C., Fortin, C., Kielly, M., Mansouri, S., & Todd, N. (2015). Canadian contraception consensus chapter 2 contraceptive care and access. *Journal of Obstetrics and Gynaecology Canada*, *37*(10), S13–S19.
[https://doi.org/10.1016/S1701-2163\(16\)39371-9](https://doi.org/10.1016/S1701-2163(16)39371-9)
- Carmichael, M. A., Thomson, R. L., Moran, L. J., & Wycherley, T. P. (2021). The impact of menstrual cycle phase on athletes' performance: A narrative review. *International Journal of Environmental Research and Public Health*, *18*(4), 1667.
<https://doi.org/10.3390/ijerph18041667>
- Ekenros, L., von Rosen, P., Solli, G. S., Sandbakk, Ø., Holmberg, H.-C., Hirschberg, A. L., & Fridén, C. (2022). Perceived impact of the menstrual cycle and hormonal contraceptives on physical exercise and performance in 1,086 athletes from 57 sports. *Frontiers in Physiology*, *13*, Article 954760.
<https://doi.org/10.3389/fphys.2022.954760>
- Elliott-Sale, K. J., McNulty, K. L., Ansdell, P., Goodall, S., Hicks, K. M., Thomas, K., Swinton, P. A., & Dolan, E. (2020). The effects of oral contraceptives on exercise performance in women: A systematic review and meta-analysis. *Sports Medicine*, *50*(10), 1785–1812. <https://doi.org/10.1007/s40279-020-01317-5>
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- Elliott-Sale K.J., Hicks K.M. (2018). Hormonal-based contraception and the exercising female. In J Forsyth & C-M Roberts (Eds.), *The exercising female*; (1st ed., Vol. 1, pp. 30–43). Routledge. <https://doi.org/10.4324/9781351200271-4>
- Engseth, T. P., Andersson, E. P., Solli, G. S., Morseth, B., Thomassen, T. O., Noordhof, D. A., Sandbakk, Ø., & Welde, B. (2022). Prevalence and self-perceived experiences with the use of hormonal contraceptives among competitive female cross-country skiers and biathletes in Norway: The FENDURA project. *Frontiers in Sports and Active Living*, 4, Article 873222. <https://doi.org/10.3389/fspor.2022.873222>
- Findlay, R. J., Macrae, E. H. R., Whyte, I. Y., Easton, C., & Forrest, L. J. (2020). How the menstrual cycle and menstruation affect sporting performance: Experiences and perceptions of elite female rugby players. *British Journal of Sports Medicine*, 54(18), 1108–1113. <https://doi.org/10.1136/bjsports-2019-101486>
- Höök, M., Bergström, M., Sæther, S. A., & McGawley, K. (2021). “Do elite sport first, get your period back later.” Are barriers to communication hindering female athletes? *International Journal of Environmental Research and Public Health*, 18(22), Article 12075. <https://doi.org/10.3390/ijerph182212075>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Journal of Clinical Epidemiology*, 134(1), 178–189. <https://doi.org/10.1186/s13643-021-01626-4>
- Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: Scoping reviews. *JBI manual for evidence synthesis*, 169(7), 467-473.
-

Swann, C., Moran, A., & Piggott, D. (2015). Defining elite athletes: Issues in the study of expert performance in sport psychology. *Psychology of Sport and Exercise, 16*, 3–14.

<https://doi.org/10.1016/j.psychsport.2014.07.004>

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., ...

Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine, 169*(7), 467–473.

<https://doi.org/10.7326/M18-0850>

World Health Organization. (2023, September 5). *Family planning/contraception methods*.

<https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception>

APPENDICES

Appendix A: Seed Articles

Clarke, A. C., Bruinvels, G., Julian, R., Inge, P., Pedlar, C. R., & Govus, A. D. (2021). Hormonal contraceptive use in football codes in Australia. *Frontiers in Sports and Active Living*, 3, Article 634866. <https://doi.org/10.3389/fspor.2021.634866>

Abstract

The recent launch of the new National elite women's football competitions in Australia has seen a 20–50% increase in grassroots female participation. With the growing participation across grassroots to elite competitions, understanding the health of female athletes should be prioritized. In elite level athletes, hormonal contraceptive (HC) use is common (~50%), however, little is known about the prevalence and reasons for use and disuse of HC in elite female football athletes. As such, the impact of HC use is often not considered when monitoring the health of female footballers. This study involved a subset of data collected as part of a larger questionnaire investigating menstrual cycle function, hormonal contraception use, and the interaction with training load volume and perceived performance in elite female football code athletes. A total of 177 participants completed the questionnaire across three football codes within Australia (rugby league, rugby union/sevens, Australian football). One third (n = 58) of athletes were currently using HC, predominately in the form of an oral contraceptive pill (OC, n = 47). Reasons for use included: to avoid pregnancy (71%); to control/regulate cycle (38%); and to reduce menstrual pain (36%). However, most athletes using an OC (89%) could not identify the type of pill used (e.g., mono-, bi-, or triphasic). The main reason for disuse was due to the negative side effects (n = 23), such as mood swings, weight gain, and depression/anxiety. When comparing HC users and non-users, no statistical differences were observed in the number of reported menstrual symptoms, use of medication to relieve menstrual pain, or frequency for needing to adapt training due to their menstrual cycle ($p > 0.05$). Since most athletes were unaware of the type of OC they used, female football athletes require further education about the different types of HC, and specifically OC, available to them. Similarities in the symptoms experienced, pain management, and training adaptation requirements between groups suggests that HC use may not have the intended outcome for certain athletes. As such, greater awareness of athlete's personal experiences with the menstrual cycle, how HC may influence their experience, and acknowledgment of non-pharmacological methods to help manage menstrual cycle related symptoms are warranted.

Keywords: oral contraception, physiology, female athlete, women, elite sport

Engseth, T. P., Andersson, E. P., Solli, G. S., Morseth, B., Thomassen, T. O., Noordhof, D. A., Sandbakk, Ø., & Welde, B. (2022). Prevalence and self-perceived experiences with the use of hormonal contraceptives among competitive female cross-country skiers and biathletes in Norway: The FENDURA project. *Frontiers in Sports and Active Living*, 4, Article 873222. <https://doi.org/10.3389/fspor.2022.873222>

Abstract

To investigate the prevalence of hormonal contraceptive (HC) use by female cross-country (XC) skiers and biathletes competing at a national and/or international level, their reasons for HC use, and to compare negative symptoms related to the HC-/menstrual cycle in HC users and non-HC users. Additionally, to characterize the self-perceived influence of HC use on training and performance. A total of 113 Norwegian competitive XC skiers and biathletes completed an online questionnaire including both closed and open-ended questions. The questions were designed to assess the type of HC, reasons for use, self-reported negative

symptoms related to HC-/menstrual cycle, as well as athletes' experiences regarding how HC use affects training and performance. In total, 68% of all the athletes used HC, with 64 and 36% of them using a progestin-only and combined type HC, respectively. Non-contraceptive reasons for HC use were reported by 51% of the progestin-only HC users vs. 75% of the combined HC users ($P = 0.039$), with reduction of negative menstrual-related symptoms as the most common reason. Of the athletes reporting regular withdrawal bleedings in connection to HC use, 80% of the progestin-only and 86% of combined HC users experienced negative menstrual-related symptoms, which was comparable to the non-HC group (86%). The majority (81%) of HC users experienced solely positive, or no effect, of HC use on training and performance, with no differences between progestin-only and combined HC users ($P = 0.942$). In total, 68% of the XC skiers and biathletes used HC, with the highest proportion (64%) using a progestin-only HC. Many athletes used HC to manipulate their menstrual cycle due to perceived negative menstrual-related symptoms that interfered with their training sessions and/or competitions.

Keywords: combined hormonal contraceptives, endurance, female athletes, hormonal contraceptives, progestin-only hormonal contraceptives

Martin, D., Sale, C., Cooper, S. B., & Elliott-Sale, K. J. (2018). Period Prevalence and Perceived side effects of hormonal contraceptive use and the menstrual cycle in elite athletes. *International Journal of Sports Physiology and Performance*, 13(7), 926–932. <https://doi.org/10.1123/ijsp.2017-0330>

Abstract

To identify the period prevalence of hormonal contraceptive (HC) use and characterize the perceived side effects associated with the menstrual cycle and HC use. A total of 430 elite female athletes completed a questionnaire to assess the period prevalence of HC use, the reasons for initiation and discontinuation of HCs, and the side effects experienced by HC and non-HC users. Descriptive statistics, between-groups comparisons, and associations between categorical variables were calculated. Of athletes studied, 49.5% were currently using HCs and 69.8% had used HCs at some point. Combined oral contraceptives were most used (68.1%), with 30.0% using progestin-only contraceptives (implant = 13.1%, injection = 3.7%, and intrauterine system = 2.8%). Perceived negative side effects were more common with progestin-only HC use (39.1%) compared with combined-HC use (17.8%; $P = .001$) and were most prevalent in implant users (53.6%; $P = .004$). HC users reported perceived positive side effects relating to their ability to predict and/or manipulate the timing, frequency, and amount of menstrual bleeding. Non-HC users had a menstrual cycle length of 29 (5) d and 77.4% reported negative side effects during their menstrual cycle, primarily during days 1–2 of menstruation (81.6%). Approximately half of elite athletes used HCs, and progestin-only contraceptive users reported greater incidences of negative side effects, especially with the implant. Because of the high interindividual variability in reported side effects, athletes and practitioners should maintain an open dialogue to pursue the best interests of the athlete.

Keywords: female athletes, dysmenorrhea, oral contraception, menstruation

Oxfeldt, M., Dalgaard, L. B., Jørgensen, A. A., & Hansen, M. (2020). Hormonal Contraceptive use, menstrual dysfunctions, and self-reported side effects in elite athletes in Denmark. *International Journal of Sports Physiology and Performance*, 15(10), 1377–1384. <https://doi.org/10.1123/ijsp.2019-0636>

Abstract

To identify the prevalence of hormonal contraceptive (HC) use, menstrual cycle disturbances, and self-perceived physical and emotional symptoms related to the menstrual cycle/pill cycle in elite female athletes. Methods: One hundred eighty-six Danish elite female athletes completed an online questionnaire to assess menstrual status and history, use of HCs, and

self-perceived physical and emotional symptoms related to the menstrual cycle or HC use. Results: Fifty-seven percent of elite female athletes in Denmark use HC, with 74% using combined HCs and 26% using progestin only. Sixty percent of oral contraceptive users reported having manipulated their menstrual cycle by continuous oral contraceptive use. Forty-nine percent of non-HC users had a regular menstrual cycle, while 51% experienced menstrual disturbances, with 1 athlete being primary amenorrheic and 13 athletes having secondary amenorrhea. Menstrual disturbances were experienced by a larger proportion of endurance athletes (69%) compared with athletes performing power and technical disciplines. In endurance athletes' amenorrhea was associated with a higher cardiovascular training volume ($P < .001$). Negative symptoms related to the menstrual/pill cycle were reported by both HC and non-HC users, whereas positive physical symptoms were experienced more often among the non-HC (14%) versus HC users (2%) ($P < .01$). Notably, 13% of the athletes reported that negative symptoms sometimes/always caused them to not participate in or complete the scheduled training. Conclusion: HC use is common among elite athletes, and continuation of HC is used to manipulate the menstrual cycle in relation to sport competitions. HC use does not abolish dysmenorrhea, but it may reduce emotional-related side effects. Menstrual disturbances are frequent in endurance athletes and are associated with cardiovascular training volume.

Keywords: menstrual cycle, female athletes, women, oral contraceptives, premenstrual symptoms, athletic performance

Parker, L. J., Elliott-Sale, K. J., Hannon, M. P., Morton, J. P., & Close, G. L. (2022). An audit of hormonal contraceptive use in women's Super League soccer players; Implications on symptomology. *Science and Medicine in Football*, 6(2), 153–158.
<https://doi.org/10.1080/24733938.2021.1921248>

Abstract

Purpose: To audit hormonal contraceptive use and associated symptomology in elite women's soccer in England. Methods: Seventy-five elite women's soccer players from the Women's Super League (WSL) completed a questionnaire to assess: hormonal contraceptive (HC) use or non-use, reasons for initiation and discontinuation and the symptoms experienced by HC and non-HC users. Results: Twenty-eight per cent reported current HC use, with 43% having used HCs previously. Combined HCs accounted for 62% of total usage, with progestin-only HCs making up the remainder. Eighty-six per cent pre-empted negative symptoms before commencing HCs, with 38% experiencing adverse symptoms. Negative symptoms were most common in progestin-only HC users (63%). Eighty-six per cent reported benefits associated with HC usage include pain management and the ability to predict or control their cycles. Six non-HC users reported amenorrhea, with one medically diagnosed. Negative MC-related symptoms were reported by 74%, with 4% unable to train due to these symptoms. Unfavourable symptoms typically occurred during the first days of menstruation (59%). Conclusion: Most WSL players do not currently use HCs (72%). Most HC users reported benefits of HC usage, whilst most non-HC users reported negative symptoms especially around menstruation. Practitioners should track players' MCs to help minimise discomfort and maximise performance.

Keywords: Women's soccer; menstrual cycle; hormonal contraceptives; symptoms; prevalence
