

Adapting Training to the Menstrual Cycle

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Recently, I (X.J.J.) was happily surprised when I was approached by *National Geographic* with a request for an interview about exercise and the menstrual cycle. It has been over 25 years now since I first started research on this topic. Back then, when I mentioned my research at social gatherings, men would usually quickly find a reason to leave the conversation. On the other hand, most women would be very interested in finding out more, but it definitely wasn't a usual topic of conversation. My initial interest in this topic originated from my personal experience of bad menstrual cramps that affected my training and performance and caused a monthly interruption of my life. As a sport-science student, I therefore started looking into this area and soon realized that just about everything I was learning during my degree was based on research with male participants. The only female-specific exercise physiology information in textbooks in the 1990s was usually a small section on sex differences, and something about the risks of exercise resulting in menstrual disorders. However, my interest and that of many other women was focused on the other side of that picture: "Does the menstrual cycle affect exercise performance?" I was very excited when I found a review by Lebrun¹ suggesting that there were subtle variations in several physiological functions throughout the menstrual cycle and that further prospective studies with hormone verification of menstrual cycle phases were needed in this area. Soon after that, I started my PhD on the menstrual cycle and exercise performance.

Interestingly, the *National Geographic* writers were interested not only in finding out more about the effect of the menstrual cycle on performance but also in the science behind adjusting training to the menstrual cycle. The interview request for the *National Geographic* story was inspired by the many "stories" and questions on TikTok about syncing training with the menstrual cycle. It is great to see this increased interest in the menstrual cycle and exercise in the community. Nowadays, most men no longer turn away when the topic of menstrual cycle is discussed, and younger generations are much more aware and open about the menstrual cycle. Likewise in sport science, research studies focusing on the menstrual cycle are steadily increasing in number, as many coaches, sport scientists, and researchers have realized that this is an important topic to be informed about when working with female athletes. Of course, the sport-science community and the *International Journal of Sports Physiology and Performance* are especially focused on the application of evidence-based knowledge to optimize training and improve performance. Adapting training to an athlete's menstrual cycle seems a promising step in the right direction.

The idea of menstrual-cycle-based training, however, is not actually that new. In 1995, Reis et al² demonstrated that adapting

resistance training to the phases of the menstrual cycle elicited better training adaptations than regular training. Their participants trained one leg every second day during the follicular phase and only once per week during the luteal phase (follicular-phase-based training), and the other leg every third day throughout the whole menstrual cycle (regular training). The follicular-phase-based training resulted in a greater increase in maximal strength (32.6%) than the regular training (13.1%). That study verified female hormone concentrations throughout the study but was limited by small participant number (N = 7) and the fact that participants served as their own control. Despite these promising results in 1996, our systematic review³ showed that since then only 3 more studies have investigated menstrual-cycle phase-based resistance training. Three of these 4 studies reported that follicular-phase-based training resulted in better training adaptations than regular resistance training. Therefore, the very limited research to date suggests that follicular-phase-based resistance training may be beneficial. However, the methodological limitations and small participant numbers indicate that much more research is needed. Clearly there is not enough scientific evidence yet to fully support this type of menstrual-cycle phase-based resistance training.

It is understandable that people want to start trying new "trends" in training. However, it is alarming to see how much misinformation is spread, mainly to young people, through influencers and so-called "experts" on TikTok and other social media platforms. The main message to female athletes should be to listen to your body, be aware of your menstrual cycle, and track how you feel and perform throughout the cycle. Once athletes become more aware of their menstrual cycle, they can then use that information to adapt their training as needed. For coaching and sport-science staff it is important to consider menstrual-cycle details and/or symptoms as a standard element of athlete monitoring. And of course, there should be an open dialogue between female athletes and support staff that includes the menstrual cycle as a normal topic of conversation.

References

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