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Presentation · July 2021

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The relationship between sports training – performance and the menstrual cycle in elite endurance athletes: Preliminary Findings

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Problem statement

Elite female endurance athletes have high training volumes, which may affect their energy and hormonal balance and, consequently, cause menstrual dysfunction **[Hackney, 2017].**

Up to two thirds of endurance athletes may experience menstrual dysfunction symptoms, which may affect their quality of living and sports performance **[Oxfeldt, 2020].**

On the other hand, despite growing evidence that the menstrual cycle (MC) phases may influence sports performance, the magnitude and the direction of these effects are inconclusive **[Meignie, 2021].**

Thus, the inspection of the relationship between the MC and training – performance in this group of athletes is in critical need.

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Aim

The aim of this study was to evaluate the knowledge-perception of elite Russian female endurance athletes of the influence of the MC on sports training and performance.

This work was a part of a larger project on prevalence of Relative Energy Deficiency in Sport among elite Russian male and female athletes.

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Methods

Fifty-two elite female track-and-field (e.g., racewalking and long-distance running) athletes (age 25.2 ± 6.7 years; height 166.2 ± 6.8 cm; weight 52.8 ± 6.9 kg) were surveyed concerning aspects of their MC via an online questionnaire (Google Forms).

The elite status of athlete was supported by their prior participation in national or international tournaments, and the achievement of no less than federal district championship status.

The questionnaire for measuring various aspects of their health and knowledge was developed by experts in the field of sports medicine and sports endocrinology.

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Methods

We studied the following parameters within the questionnaires:

- Presence of menstruation within the last six months
- Presence of Pre-Menstrual Syndrome (PMS) symptoms
- Perception of the influence of MC phase on sports performance
- Alteration of training or competition schedule due to MC phase or PMS symptoms
- Knowledge of the MC phase when the athlete had the best sports performance for the last 18 months
- Comfort of speaking with their coaches about various aspects of athlete's MC

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Main results

- Only 6% (n=3) of athletes did not menstruate within the last six months
- 65% (n=32) of the menstruating athletes frequently experienced PMS symptoms
- 63% (n=31) of the menstruating athletes felt that their sports performance was affected by their MC phase
- 31% (n=15) of the menstruating athletes altered their training or competition schedule due to their MC phase on training or competitions.

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Main results

- 14% (n=7) altered their training or competitions due to PMS symptoms
- 57% (n=28) did not know which phase of the MC they were in when they had their best sports performance within the last 18 months
- 75% of all athletes (n=39) felt comfortable speaking to their coach about aspects of their MC and its impact on their training or competitions.

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Discussion

Our results can be compared to those from the study by Solli et al. where the authors showed that up to 49% of biathlon and cross-country skiing female athletes noticed changes in their performance during a specific MC phase. In that study only 8% of participants reported having sufficient knowledge about the MC in relation to training. Only 27% of participants communicated about MC with their coach.

Solli GS, Sandbakk SB, Noordhof DA, Ihalainen JK, Sandbakk Ø. Changes in Self-Reported Physical Fitness, Performance, and Side Effects Across the Phases of the Menstrual Cycle Among Competitive Endurance Athletes [published online ahead of print, 2020 Sep 21]. *Int J Sports Physiol Perform*. 2020;1-10. doi:10.1123/ijspp.2019-0616

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Discussion

Another study by García-Pinillos et al. found that 79% of female athletes reported that the MC affects athletic performance, although the majority of the athletes (71%) said they did not change their training program with relation to their MC phases.

García-Pinillos F, Bujalance-Moreno P, Jérez-Mayorga D, et al. Training Habits of Eumenorrheic Active Women during the Different Phases of Their Menstrual Cycle: A Descriptive Study. Int J Environ Res Public Health. 2021;18(7):3662. Published 2021 Apr 1. doi:10.3390/ijerph18073662

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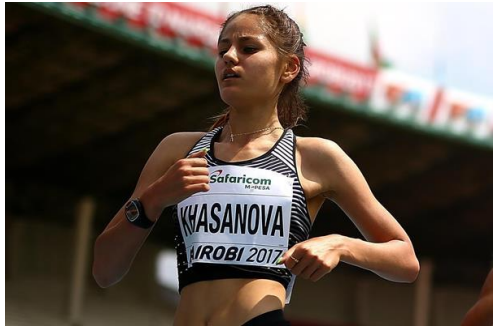
Conclusions

- PMS symptoms and MC phase may affect the training and competition schedule of elite women endurance athletes.
- The majority of female athletes felt comfortable speaking about the MC with their coaches.
- Despite this, more than half of athletes did not know in which phase they had their best performance.
- This prior finding could be an indicator of poor understanding or tracking of the relationship between the menstrual cycle and sports performance.
- More expanded research on the role of the MC on training and sport performance is warranted.



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How can we use this information?

For coaches:

- Better tracking of MC is needed.
- Encourage your athletes to speak about MC – performance relationships.
- Training and competitions schedule planning should take into consideration MC phases **[Carmichael, 2021]**

For sports medicine professionals:

- The incidence of amenorrhea may be low in Russian elite endurance athletes.
- The specific prophylactic measures used in this population (high-calorie diet, long sleep duration, supplements) should be evaluated and implemented in practice

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Limitations and Future Directions

As with all studies, the present one has several limitations:

- The study sample is relatively small
- The results should be considered preliminary, since work is currently in the process and on going
- Only self-reported, subjective measures (questionnaires) were obtained
- In the future, we plan for more objective, physiological measures

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